Northwest Electric Light & Power Association Convention Number

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June 1, 1926
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Journal of Electricity

Devoted to the Economic Production and Commercial Application of Electricity
IN THE ELEVEN WESTERN STATES

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In Long Beach Steam Plant No. 2 of Southern California Edison Company the four 1510 h p Connelly boilers now in service, as well as those in the new unit under construction, are insulated with Sil-O-Cel, a Celite product which needs no introduction to steam power plant engineers.
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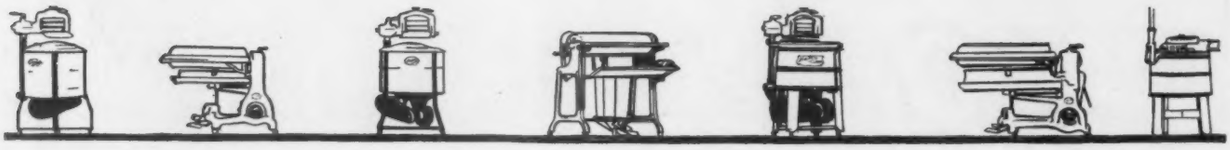


Fifty-Five Years of Store Selling

THE COUNTRY GENTLEMAN — THE SATURDAY EVENING POST, June 5, 1926

How the best washers and ironers find their way into the best stores and homes

OURS is a country of vast production—and of vast *distribution*.

When the family buys a modern electric washer or ironer, it is conscious of having to pay what it costs to *make* the machine, forgetting that there is also a cost of getting the machine from where it was made to where it is going to be used.

Yet costs of *distribution* are apt to vary, as between different producers, much more than their costs of production.

So the cost of distribution is apt to *determine* cost of production—and therefore quality.

The natural and economical distribution is from maker to wholesaler, to local store, to home.

Neither the wholesaler nor the local store can afford to carry and sell *all* the many different kinds of washers and ironers.

Each, therefore, tries to select the best from the many.

If one store has the best, another wanting something different, aims to have the next best.

But in the main, the wholesaler with the largest business, and the local store with the largest patronage, are apt to carry and sell the best.

Natural selection works out that way.

And if the maker who wins the best-store selection has the best machine in the first place, he soon has a better machine because his advantage of lower-cost distribution enables him to have a higher cost of production—a better quality.

Almost everywhere the best and biggest local stores and the best and biggest Hardware Wholesalers carry and sell Horton Washers and Ironers.

The current from Horton to Home flows naturally, at lowest conceivable cost, in a channel deeply grooved by fifty-five years of trading.

That is why Horton advantage and Horton quality and prestige have grown importantly with the years.

You need only follow the expert selection of wholesalers and stores, affirmed and re-affirmed year after year.

See if it has worked out this way in your town.

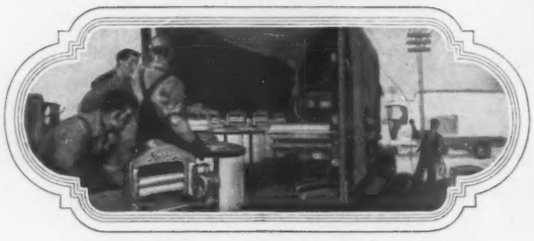
Please your best local store and tell them you would like to know more about Horton Washers and Ironers.

THE HORTON MANUFACTURING COMPANY *(Established 1871)* FORT WAYNE, INDIANA

HORTON *Washers Ironers*

SOLD BY 8086 STORES

THE SATURDAY EVENING POST — June 19, 1926



Fifty-five years of experience guides the American woman in her selection

A SMALL horse-drawn wagon probably delivered the first Horton to the first store that ever sold a washing machine.

That was back in 1871,—fifty-five years ago,—but it has an important bearing on what you get, for what you pay, for a modern electric washer or ironer, delivered in a modern motor truck, to the modern store today.

That first machine was a Horton.

And Horton Washers and Ironers are sold by stores today as they were fifty-five years ago.

Therein lies the determination of Horton quality and value—and quite generally the quality and value of other washers and ironers.

Quite naturally, the first mechanical washer took the natural and economical channel of distribution,—maker to wholesaler, to local store, to the home.

Quite naturally, other people made washers—until today thousands of homes want modern electric washers and ironers, and hundreds of people make hundreds of kinds.

The wholesalers and stores are constantly plied with to carry and sell all these different kinds—which, of course, they cannot do.

So the wholesalers and the stores select the best of the kinds—and the others have to sell by personal canvassing or other methods.

Any other method than the natural, store-method of selling is apt to be more expensive.

If the selling or distribution method is more expensive, then the price must be higher—or the quality lower.

To compete with Horton, at the Horton price established by low-cost, Hardware-Wholesaler, Local-Store Distribution, others with higher distribution costs have had to skimp the quality.

Through all these fifty-five years, Horton has held the confidence of the greatest Hardware Wholesalers and the best Local Stores.

Hortons have by far the greatest natural, unforced sale of all washers and ironers.

That is why it is safer to buy a Horton from a responsible local store than some other kind from a stranger at your door.

Quality in a modern electric washer or ironer, means doing the work easily and well, doing it year in, year out, with little or no service requirement, doing it for many years.

On that score, American women, as a rule, say "There is nothing like a Horton."

THE HORTON MANUFACTURING COMPANY *(Established 1871)* FORT WAYNE, INDIANA

HORTON *Washers Ironers*

SOLD BY 8086 STORES

A Nationally Organized Movement to Increase Retailers' Profits

TO Make Retailing More Profitable is the basic object of this great movement to concentrate buying of household Laundry Equipment in Retail Stores.

More than a hundred leading Hardware Jobbers are economically distributing Horton Electric Washers and Ironers to dealers in every state.

Eighty million pages of advertising are selling the public on buying Horton from Reliable Local Merchants.

Let us send you "Getting Back Into the Main Channel"—it will tell you how you can get your share of this bigger profit.

THE HORTON MANUFACTURING COMPANY, *(Established 1871)* 1024 Fry Street, FORT WAYNE, IND.

HORTON *Washers Ironers*

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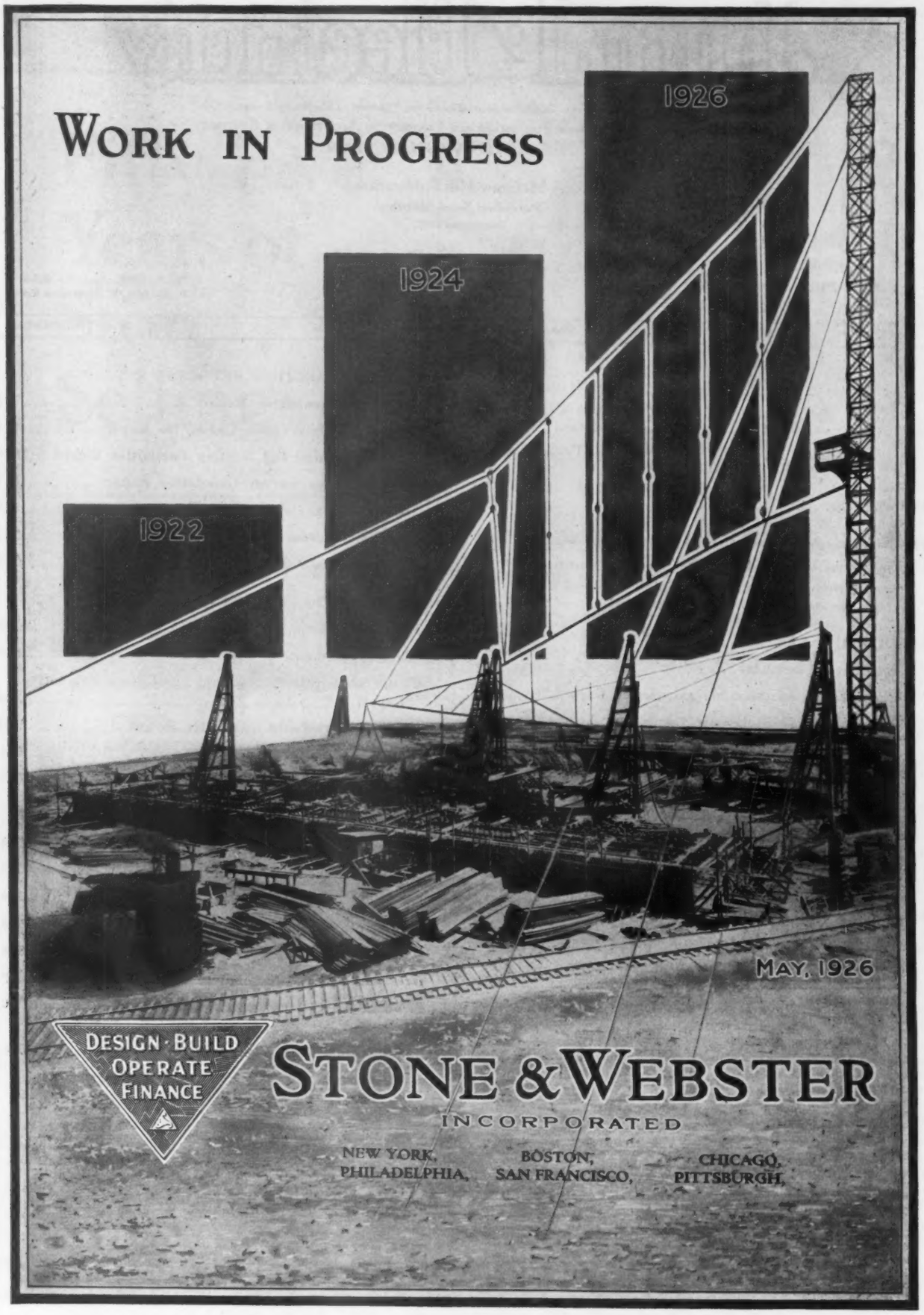
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EDITORIAL

Serving the Pacific Northwest

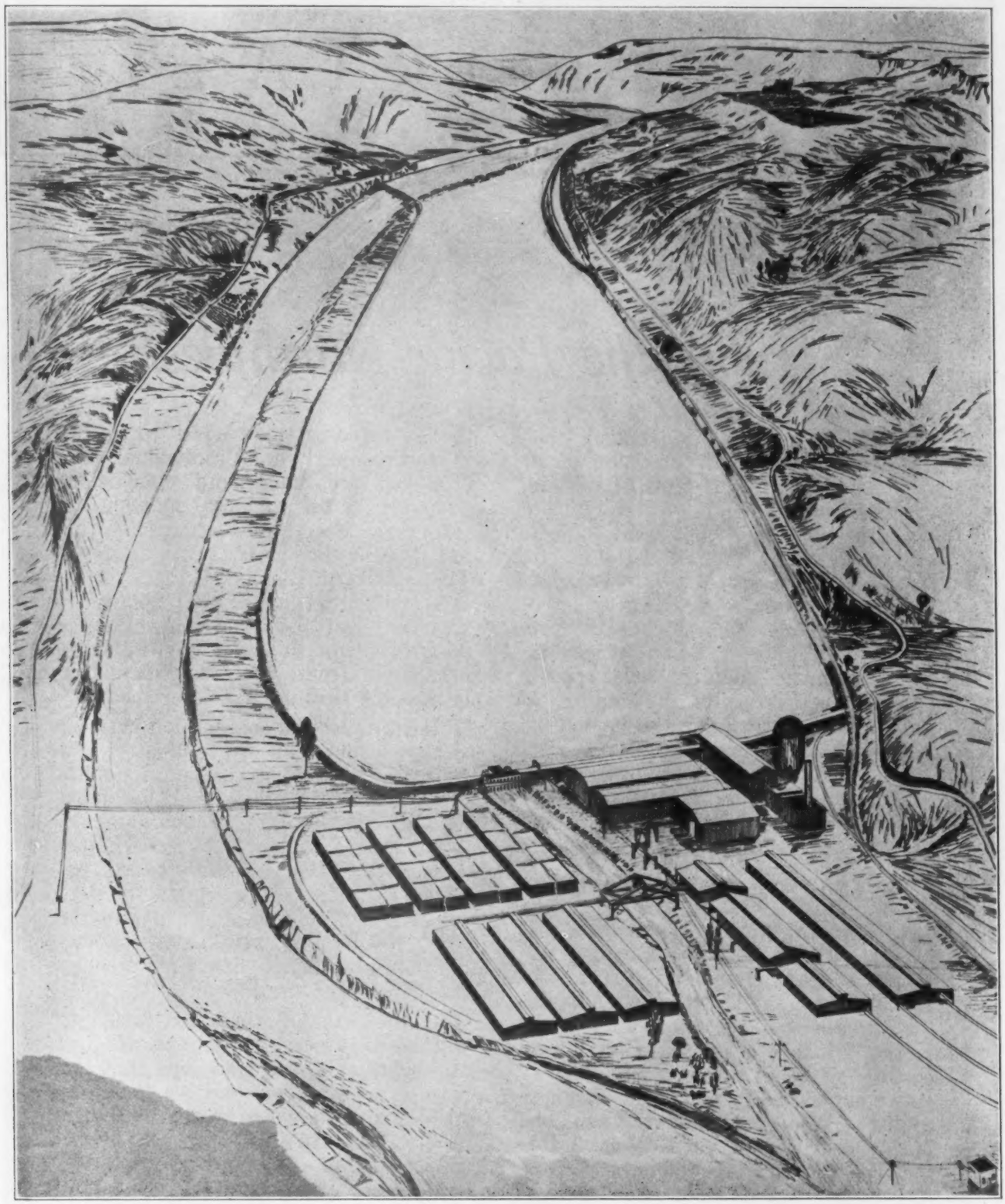
THIS issue of the Journal of Electricity marks an extension of its service that is of more than passing interest. Through an arrangement recently concluded with the officers and executive committee of the Northwest Electric Light and Power Association, the Journal presents to all of its readers for the first time the preconvention publication of that association's committee reports. These reports summarize the results and findings of all committee work for the past fiscal year covering the progress of the electrical industry in the great Northwest, a territory comprising the states of Oregon, Washington, Idaho, Utah and Montana.

IT is with no little pride that this announcement is made. Through the two associations, the Pacific Coast Electrical Association covering California, Arizona, Nevada and Hawaiian Islands, and the Northwest Association, the Journal of Electricity offers to the industry in the West a medium of publicity that is as nearly 100 per cent complete in the comprehensiveness of its service as is humanly possible. Moreover the intention is to make this service even more complete.

THE value of this service to the industry as a whole is obvious. The studies, researches, and conclusions prepared by the students, analysts and leaders in every geographical section are thus at the disposal of everybody. The spirit of the slogan, "Better and Better Service to the Public," is fostered and promoted through the wide dissemination of knowledge in a manner and with a thoroughness that is possible through no other means.

THE intellectual communion between the leaders of the industry, the educational and inspirational quality brought into the offices and the homes of the rank and file of the industry personnel, cannot do other than cement more firmly than ever the bond of fellowship among the electrical men of the West and create a greater and greater solidarity within the industry by the interchange of ideas through the columns of the Journal.

TO the men of the Northwest we take this occasion to express our appreciation of the privilege that has been granted to us, and we look forward with confidence to the discharge of our responsibility with all the resources at our command.



ENGINEER'S sketch of the proposed Lewiston hydroelectric development of the Inland Power & Light Company, looking east. A diversion dam 35 ft. high on the Clearwater River will turn water into a flat now used for small farms, creating a 400-acre forebay and log pond. An earth fill dike, 7,000 ft. long, running along the river sustains the forebay. In the dike at the west end of the forebay is seen the power house, which will contain two 5,000-kw. units. A tailrace 4,500 ft. long carries the water back to the river below. A 66,000-volt tie line will connect the development with the Yakima-Walla Walla line of the Pacific Power & Light Company, which will operate the property. Adjacent to the power house will be the proposed sawmill development of the Clearwater Timber Company (a Weyerhaeuser company), which will cut 200,000,000 ft. per year. Lewiston, Idaho, lies west of the development.

The Northwest's Contribution to the Passing Year

By Lewis A. Lewis

President, Northwest Electric Light and Power Association; Northwest Division, National Electric Light Association

A YEAR significant in many of its aspects is being brought to a close for the Northwest Electric Light and Power Association with the convention in Spokane, June 14-17, 1926. Looking back over it, the year has been productive of many notable works.

As the Northwest Division of the National Electric Light Association this Northwest Association was given responsibility for the conduct of the National Electric Light Association's activity in this field. The electric range survey conducted for the parent organization provided this Association with an opportunity to contribute something of value to the knowledge of the industry upon that important domestic appliance, the electric range. By reason of the highly intensified range load in this territory, a committee from our Association has been able to assemble information which will have an important part in making electric cooking universal. The electric range survey and the report covering it will be important items of discussion at the convention.

LEWIS A. LEWIS

President of the Northwest Electric Light and Power Association, who reviews the work of the organization for the past year and comments upon the coming convention

In its own particular and oftentimes distinctly sectional activities, the Association likewise has made careful analyses of its problems and studied into their remedies. Each of the Sections of our Association has had a fruitful year. Individually they have carried out their programs in a highly commendable manner.

Early in the year three of the four Sections of the Association, namely: the Accounting, Commercial and Technical Sections, each resolved to hold a two-day Section conference to better discuss and co-ordinate the work each had set out to accomplish. These conferences achieved the objects sought for to a very satisfying extent and many important thoughts and ideas were developed in them.

In the Public Relations Section, too, many valuable contributions to the good work of the industry have been made. Particularly noteworthy, in my opinion, is the work of the Women's Committee on Public Information. Its effect upon public relations has been a definite reality this year. The promise it gives for further activity is also worthy of attention.

While public relations generally is in excellent shape in the various states of this division, legislation inimical to the interests of the industry has been proposed in Oregon. The attention of members is directed particularly to the report of the vice-president in charge of public relations for Oregon in which these measures are discussed. The problem of selling our industry to the public to such an extent that political radicals will not dare to propose legislation which threatens its well-being is one to which more time and study must be given.

At the convention, because so much of the actual Section work has already been accomplished in the Section two-day conferences, we hope to present a program strong in its educational and inspirational features. Largely the program will consist of addresses by persons of broad experience and keen insight into the problems of the industry, although some time will be devoted to Section work as well.

We hope to stress the importance of the residential load in public utility development. We hope to urge a more consistent sale of current-consuming devices for the home. In this field lies much of the best load which a central station may cultivate.

Rural electrification, we hope to show at the convention, must be given more constructive thought by executives of power companies. This we feel must come, notwithstanding the fact that the West is well ahead of other sections of the country in farm electrification.

Accounting Section Reports

Executive Committee Report*

Organization of this section was completed Sept. 21, 1925, under the standing committee revision of the Accounting National Section, Aug. 20, 1925.

In the revision marked changes were made in committee nomenclature. The budget, customers' records and billing methods, filing and preservation of records and payroll standardization committees ceased to exist as such. The budget committee became national in scope rather than local, while the customers' records and billing methods and filing and preservation of records were merged into the accounts receivable committee, and statistical methods committee, respectively, two entirely new committees. Payroll standardization was absorbed by the accounts payable committee, a committee inactive for several years past but again given recognition.

Paralleling the Accounting National Section were appointed committees as follows:

Classification of Accounts

M. J. Wilkinson, chairman, assistant secretary and assistant treasurer, Pacific Power & Light Company, Portland, Ore.

Purchasing and Storeroom

F. W. Brownell, chairman, comptroller, Puget Sound Power & Light Company, Seattle, Wash.

Fixed Capital

J. A. Rockwood, chairman, valuation engineer, Portland Electric Power Company, Portland, Ore.

Accounts Payable

F. H. Anderson, chairman, assistant treasurer, Puget Sound Power & Light Company, Portland, Ore.

Accounts Receivable

A. E. Janssen, chairman, treasurer, Idaho Power Company, Boise, Idaho.

Statistical Methods

Wm. H. Hawkes, chairman, Puget Sound Power & Light Company, Olympia, Wash.

D. F. McCurrach, vice-chairman, statistician and rate engineer, Northwestern Electric Company, Portland, Ore.

Scope

Scope of committee work was designated as follows:

Classification of Accounts Committee.—To endeavor to secure the adoption of the uniform classification of accounts and standard form of annual reports by all member companies and by regulatory commissions having jurisdiction over accounting procedure; and to assist in their interpretation and application.

Purchasing and Storeroom.—To study and report on systems of accounting for the purchasing, storing and issuing of materials and supplies.

Fixed Capital Committee.—To study and report upon methods for the preparation, maintenance and use of fixed capital records and accounts, including work order or other related systems under which distribution of capital expenditures is accounted for.

Accounts Payable Committee.—To study methods and practices for accounts payable including general ledger accounts, voucher check systems and payroll standardization.

Accounts Receivable Committee.—To study methods and practices for accounts receivable, including customers' records and billing, meter reading, credits and collections, and merchandise accounting.

Statistical Methods Committee.—To study and report upon methods for the arrangement and preservation of statistical data, including graphic presentation; to promote the standardization of statistical information and terminology, and to study developments and changes in filing, preservation and destruction of records.

Activities

The geographic divisions were organized Oct. 21, 22, 1925, at St. Louis, Mo. Our section had three representatives at that meeting, a somewhat larger number than usual at Accounting National group conferences. The convention was for the purpose of coordinating accounting section activities. These, in brief, called for securing permission from an executive for a desired man to serve in any capacity on committee work, with territorial subdivision of the district for the purpose of canvassing them for problems peculiar to the utilities therein, and submitting them to the national body for study and research.

The principal is sound fundamentally since it weaves into the fabric of the accounting story problems furnished by the industry at large rather than those furnished by a selected group of preferred specialists. It is obvious that this plan presents a broader view of our problems, with the resulting solutions truly national in interpretation. Breaking down the sources of information into districts and restricting each district to a particular committee prevents duplicating requests for information within that territorial zone. It also allows committees to meet at small expense and loss of time at some central point within their field of action to discuss matters pertaining to their work, without being forced, as in the past, to transact their business at long range.

The geographic chairman selects the standing committee chairmen only, while the latter select their own committeemen. Because of this phase of the plan each chairman assures for himself a reasonable measure of co-operation for a successful committee year.

This, in brief, is the co-ordinate plan and is recommended as the proper basis of procedure in committee work.

Assignment of Work

The governing committee, comprised of standing committee chairmen, met Dec. 4, 1925, and reported progress. At that time it was decided to hold a group meeting Feb. 1, in Portland. Here crystallized the idea of imposing upon a committee something definite to accomplish, some specific line of action to follow rather than to attempt to cover the entire scope of a committee's work. Topics in tentative form for discussion were assigned to the several chairmen upon which to present papers with the ultimate plan that of using the material brought out in conference in the finished report. The subjects assigned embraced inventories, annual reports, distribution records adaptability of machines to accounts payable records and payroll distribution, and exchange of credit information.

On Feb. 1, 1926, the first group meeting of our section was held. The attendance was far in excess of our most sanguine expectations, and while Oregon and Washington alone were represented it is hoped that a continuance of such meetings yearly will ultimately attract the membership of other states within our division.

Tentative reports were submitted under the subjects assigned at the meeting of Dec. 1, 1925. Fairly good indices to a successful meeting may be considered by the number participating in the discussion, and the breadth of ideas brought out. The conference was active, interest widespread and discussion lively. Minutes of the meeting were reported in regular form, and each chairman later secured that part of the minutes relating to his particular work, so that he might have the benefit of the discussion appertaining to it in the preparation of his final report.

In addition to the subjects assigned there certain matters were debated relating to accounting methods as connected with methods of practice in handling items removed from a plant and taken into stores; methods of computing interest during construction; costs of maintaining temporary service during construction; costs of moving a telephone line to provide clearance for constructing a power line; costs of re-

* **A. J. Johnstone,** Portland Electric Power Company, chairman. **Idaho Power Company:** A. E. Janssen. **Northwestern Electirc Company:** D. F. McCurrach. **Pacific Power & Light Company:** M. J. Wilkinson. **Portland Electric Power Company:** J. A. Rockwood. **Puget Sound Power & Light Company:** F. H. Anderson, F. W. Brownell, W. H. Hawkes.

moving existing equipment in a power plant or substation to make room for additional installations.

It was the consensus of opinion that certain of these subjects be submitted by the Classification of Accounts Committee to the national committee for solution and interpretation, that its decisions might become available to the industry at large.

A resolution was offered thanking the Portland Gas & Coke Company for its courtesy in permitting the use of its assembly room for the conference.

This section feels that much benefit is to be gained through group meetings, and strongly advocates their continuance. We recommend, therefore, that at least a mid-winter group meeting be held each year and urge that such practice become a part of the accepted routine.

Work Accomplished

A resume of the work accomplished by the several committees follows:

Classification of Accounts.—Interest was centered upon the adoption by the several states of the Railway and Utility Commission, Simplified Form of Annual Report. This form has much to commend it, containing as it does all the best features of the state commission form of report now in use. Besides giving standardization of statistics, above all else, and the thing most desired, it gives uniformity for those utilities operating in several states.

Purchasing and Storeroom.—This committee set out with the idea of accomplishing something for the benefit of the smaller companies; and submitted a very comprehensive report on "Inventory of Supplies." While the committee had in mind the small utility inventory conducted on an annual basis, the system outlined proved to be admirably adapted to the large utility as well. The committee, therefore, heartily recommends the method to those companies without an orderly system of inventory.

Fixed Capital.—The efforts of this committee were largely concerned with the methods which have to do with distribution records. In providing something which might be of benefit to those companies interested in arranging their detailed records in accordance with accepted practices, this committee has outlined a system which is the result of experience gained in many a year's study as well as the application of basic principles. Because of the danger of too great refinement in detail of such records, the committee has not recommended it for general use by all utilities, but is hopeful that application of the system may prove helpful to those companies which are desirous of keeping such records at a minimum expense).

Accounts Payable.—This committe considered the uses of tabulating machines in connection with distribution of vouchers and payrolls, with special reference to the records of small companies. Objections have been raised to some types of machine on the grounds that there are enough problems in accounting without injecting those of mastering a new language. However, distribution can still be accomplished by other types of machines which may be adapted to work of this nature.

Accounts Receivable.—Standardization of practice with respect to interchange of credit information seemed desirable; therefore, the committee considered this phase of the scope of its work only. In practice the system hinges largely on public relations, in that a new consumer is allowed to establish his own credit without being obliged to cover his account for service by deposit. In the larger companies the credit department moulds the opinion of a new customer. It is obvious that if he is allowed to establish his rating through references, as is the custom with mercantile houses, his impression of the utility is favorable from the outset. Serious consideration should be given to this plan by all utilities embraced in our group.

Statistical Methgods.—Due to conditions imposed through a change of residence it became necessary for the chairman to appoint a vice chairman to carry on the work of this committee. D. F. McCurrach, statistician and rate engineer, Northwestern Electric Company, was selected to fill this very important position and has submitted a very comprehensive report dealing with the statistical information deemed essential to the industry. The subject is entirely new and the object seems to be to minimize details in connection with keeping information for reports and publications. There is some likelihood of conflict between the work of this committee and that of the committee on simplified annual reports; therefore, it would seem that this work should be national in character rather than local.

Classification of Accounts Committee Report*

Although the committee year has not been completed, we wish to report the progress that has been made to date with respect to the special work assigned to this committee on classification of accounts and annual reports.

As stated in previous reports, all of the state commissions within this geographical section have adopted the uniform classification and therefore the efforts of this committee have been directed towards the adoption of the uniform annual report.

We are pleased to be able to report that the state of Idaho has adopted this annual report form as issued by the National Association of Railway and Utilities Commissioners.

In conjunction with the new classification of accounts adopted by the Oregon Public Service Commission as of Jan. 1, 1925, a new report form has been compiled and it is evident that suggestions pertaining to uniformity were given consideration in so far as the financial portion of the report is concerned, but relative to the statistical portion of the report, no heed was given, as the detail requirements of this new form far exceed anything heretofore requested.

The committee has held an informal interview with the chief engineer of the Oregon Public Service Commission, who is responsible for the compilation of this new report form, and he has agreed to discuss that portion of the report which might be considered burdensome and inconsequential.

During the remainder of the committee year it is the intent to present to each public service commission within this section, our arguments in favor of the uniform report with the view of its adoption but it must be remembered that it will take time and discretion to accomplish the desired results.

*M. J. Wilkinson, Pacific Power & Light Company, Chairman. Idaho Power Company: R. W. Miller. Puget Sound Power & Light Company: C. F. Kirchaine.

Purchasing and Storeroom Committee Report*

The work of this committee has been limited to the subject assigned; namely that entitled "Inventory of Material and Supplies."

The uniform classification of accounts for electrical utilities provides that inventories of materials and supplies should be taken at least annually. This can be accomplished in one of two ways:

First.—By what is called a continuous inventory, which plan is generally applied by inventorying a specific portion of the supplies each day, reconciling the physical stores record with such inventory and once each year, or more often, reconciling the physical stores record with the control account on the general books.

Second.—By what is generally referred to as an annual physical inventory.

From an accounting standpoint there is no question but that the continuous inventory plan has a great deal of merit, but from a practical standpoint the annual physical inventory plan seems to be more advantageous and to obtain better results. For the purpose of this paper the discussion will be confined entirely to the annual physical inventory plan.

Annual Physical Inventory Plan.

While the taking of an inventory of materials and supplies of each utility company is made mandatory by the regulatory bodies, it must be recognized that such an inventory serves many beneficial purposes to the utility. It furnishes a comprehensive record of the classifications and quantities of materials and supplies on hand in such a manner as to keep this information readily available for the attention of the officers and executives of the company, providing a basis for a thorough survey of the material and supply situation. It discloses any overstocks and determines which is slow moving and obsolete stock and therefore should aid in the disposal of all obsolete stock and scrap. After an inventory has been properly prepared the accounting officer finds himself in a position to attract the at-

*F. W. Brownell, Puget Sound Power & Light Company, chairman. Mountain States Power Company; B. E. Lee. Northwestern Electric Company: Wm. M. Adam. Portland Electric Power Company: E. I. Snyder.

tention of the officers of the company, as well as the department heads to the supply situation. From the conferences on the subject may be determined definitely the policy of the company in connection with materials and supplies for the ensuing year.

From an accounting standpoint there is another purpose which an annual physical inventory may serve, one which cannot be overlooked. An inventory, properly taken and carried through to completion, with the necessary auditing work judiciously done as concerns the reconciliation of the control account with the inventory, brings to light forcibly any weaknesses in the supply accounting system, in storage facilities, and in the personnel of the stores department and accounting department. If this feature is taken advantage of by the accounting officer, proper remedies may be applied to the extent that stores accounting facilities will constantly improve.

Plan in Advance

Inventorying materials and supplies, like any other work, if it is to be done efficiently and well, must be planned in advance. The plans will take into consideration the classes, quantity, and condition of the material; the housing and arrangement and the personnel of the organization which can be drafted upon to do the work.

The date for taking the inventory should be established in advance. Where a company has more than one, especially when it has several supply accounts, it is suggested that the date of inventorying the various accounts be spread. In case a company has twelve or more supply accounts, an inventory or inventories can be taken at the close of each month. Notice of the date upon which inventory is to be taken should be sent to all departments involved and their co-operation and assistance should be requested.

As the inventory date approaches, the storekeepers and others in charge of supplies should run their stocks down to minimum quantities so as to avoid high inventory costs as well as high inventory values. The storeroom should make prompt reports of all shipments of materials coming into the storeroom and all issues of materials leaving the storeroom in order that the accounting department records may be entirely up to date at the time the inventory is taken. A few days before the date of the inventory, depending, of course, upon the size of the stock to be inventoried, the construction and operating departments should be requested, insofar as possible, to anticipate their requirements of materials over the inventory date so that such material can be ordered and drawn out of the storeroom before the count is started.

The storekeeper and his organization should be sure that all of his stock is properly arranged and housed in such a way as to facilitate to the greatest possible extent the counting and inventorying. Each item of stock should be separate and each class of stock should be assembled in one section of the storeroom. Cedar poles, cross-arms and lumber should be so stored that they can be properly measured or counted; iron and wood pipe, bar iron and steel and other heavy materials should be so arranged that they can be accurately checked up with the least possible delay and expense.

It should be borne in mind that the inventory is to be a physical count of the materials and supplies on hand, compiled entirely independently of the stores records. If the organization of the company is sufficiently large to so warrant, it is suggested that the taking of the inventory be placed under the supervision of a competent man from outside of the immediate personnel of the stores being inventoried. Such a man would act, of course, under the direction of the accounting officer of the company.

Bin Cards

Before starting the count, necessary bin cards should be provided and serially numbered. For this purpose the form set forth in Fig. 1 is recommended. This bin card is so drawn as to show the supply account being inventoried, the date, catalogue number, description of goods, amount on hand, amount taken out, rate and value. This card will be found practical for either a small stores account or a large one.

The physical count should start at a given point in the storeroom, preferably at the end of the room or at one corner, and should continue through the various bins in the order of their arrangement, regardless of the nature of the material contained therein, to the end that no materials will be overlooked and not inventoried. As the material in one bin is counted the bin card should be filled out and tacked on the face of the bin immediately, the tack being placed through the upper right-hand corner. Any material

DATE _____ CARD NO. 1462 1462

CAT. NO. _____ PATTERN NO. _____

SUPPLIES _____

DESCRIPTION _____

ON HAND			TAKEN OUT	RATE		PER	AMOUNT	
WEIGHT	PIECES	FEET						

Fig. 1. Bin card that facilitates inventory.

put into or taken out of the bin during the period in which the count is being made should be recorded properly on the card. When the count has been completed entirely the bin card should be pulled, leaving the detachable corner, bearing the duplicate serial number, on the bin.

After all cards have been gathered they should be sorted first to see that all serial numbers are accounted for. If a card has become lost, reference to the tag left on the bin will identify the material which it covered and supply the means for furnishing a duplicate card. The cards should be sorted again in the order in which the price and physical records are kept and should then be compared with the physical record for quantity, priced from the price records, and extended. Where discrepancies between the inventory count and the physical records are noted, by following the serial number, reference can be made back to the physical material and a recount made.

After the cards are priced and extended and all differences between the physical count and the physical record are traced the cards are then ready for tabulation. Ordinarily an inventory is required made in the same order as the arrangement of the price cards, however, with the use of the bin cards, almost any arrangement may be made by resorting. The cards, when properly arranged, are ready to be turned over to a stenographer for the typing of the inventory sheets. For this purpose the form set forth in Fig. 2 is suggested.

Inventory Sheets

This form makes provision for the approval of each sheet by the various persons involved in taking and completing the inventory. It also segregates the value of materials and supplies on hand between "active" and "inactive," thus forcibly bringing to the attention of the officers of the company and others involved, the company's investment in slow moving materials. Each sheet of the inventory should be numbered serially and totaled separately and a recapitultion of the page totals, reflecting the total value of materials and supplies on hand, should be made a part of the inventory.

The inventory count, under ordinary conditions, should be brought to completion by the close of the inventory date, generally the last day of the month. Under ordinary conditions the inventory should be completed, that is, priced, extended, verified and totaled, within ten days or two weeks after the inventory date. By this time the accounting officer

M33H 10,000 10-25-24

_____ COMPANY _____ DIVISION

INVENTORY OF SUPPLIES _____ AS OF _____ 192__ SHEET NO. _____

Taken by Priced by Ext. & Fi'gs by Appr'd by Verified by

CAT NO.	DESCRIPTION	ARTICAL FEET OR WEIGHT	RATE		PER	AMOUNT ACTIVE		AMOUNT INACTIVE	

Fig. 2. Form of inventory sheet found effective.

should have determined the balance reflected in the control account as of the closing date of the inventory and be in a position to compare immediately the total of the inventory with the balance of the control account.

The work of inventorying should not stop here, however. A thorough investigation should be made to see that all charges and credits taken into account by the stores deparment prior to the closing date of the inventory have been carried to the control account, and likewise that all charges and credits to the control account have been taken into account by the stores department. Any discrepancies of this kind should be tabulated with direct reference to their source and should be added or deducted, as the case may be, to the balance of the control account, thus coming to a corrected balance to be compared with the total of the inventory.

In case there is a difference between the balance of the control account, or the corrected balance, and the total of the inventory, such difference should be thoroughly investigated with the view to finding the causes for it. This investigation, if necessary, should be carried to a thorough audit of all accounting affecting the control account since the date of the last inventory. While the difference involved may be small, it is recommended that this investigation be made to disclose any weaknesses in the stores accounting.

When the differences have been investigated and the accounting officer is satisfied with the results, a reconciliation statement should be set up, and proper adjusting journal entiries drawn. It is suggested that this reconciliation sheet and copies of the adjusting journal entries be made a part of the inventory. The inventory page upon which the reconciliation and adjustment are set forth should carry the approval of the accounting officer, the executive officer or manager, the storekeeper and the chief clerk.

With proper supervision and direction the adjustment of the control account to the inventory in practically all cases can be recorded in the month's work directly following the inventory date. It is of importance that this be done, for immediate and prompt action in investigating and locating inventory differences is quite essential to good results. The inventory, when completed and the adjustment recorded, should be bound in suitable covers, properly labeled and filed as a part of the company records. It is generally advisable to make several copies of the inventory in order that they may be supplied to the various heads of departments to whom they may be useful and instructive.

House Cleaning

In order that the company may receive the full benefit to be derived from an inventory it is suggested that as soon as the inventory is completed and copies of it are available, the accounting executive arrange to have the heads of the various departments interested, together with the storekeeper and himself, visit the storeroom and go over the materials and supplies, item by item, in view of removing from the supply account and disposing of all materials and supplies on hand which are no longer used or useful in the business of the company.

This annual house-cleaning has a very beneficial effect in developing the interest of the various department heads in the company's investment in working capital. It also results in the conversion of materials no longer useful to the company into cash. In many cases, by the removal of such material from the storeroom, it relieves a congested situation and defers added investment in stores facilities.

Fixed Capital Committee Report*

The activities of this committee this year have been centered largely on the investigation of one phase of accounting for fixed capital. The National Committee on Fixed Capital Record Accounting this year took up the whole subject of fixed capital accounting by means of subcommittee investigations. To the Northwest Association committee there was assigned for investigation the question of "Detail of Distribution and Transmission System." Accordingly, the committee's activities have been largely limited to this special investigation.

The Northwest committee has not attempted to make definite recommendations on methods to be used by all companies regarding the details of records on their transmission and distribution systems, but have attempted only to make suggestions regarding these records. The question is not as to what can be done, but what it is wise to do. It is possible to use so much energy and spend so much time on these records that their cost is out of proportion to their value. Consequently, the attempt has been made in this report to suggest a combination of records of maximum value at a minimum of expense.

Detail of Distribution and Transmission System

The question as to how far to go in the matter of records of light and power distribution equipment has long been a vexing one. The question is not what can be done, but what it may be advisable to do. On the one hand, there are certain minimum requirements with which every company must comply. On the other hand, it is possible to detail the cost of each individual pole, crossarm, insulator, etc., of the distribution system. An attempt will be made in this discussion to suggest a combination of records and

* J. A. Rockwood, Portland Electric Power Company, chairman. Pacific Power & Light Company: J. C. Hawkins. Puget Sound Power & Light Company: H. L. McPherson.

costs which will produce a maximum of usable information at a minimum of cost.

It is not our idea to make recommendations as to the methods that should be followed, but to give a few suggestions which might be of value to companies who are facing the question as to how far to carry distribution records. These suggestions are the result of experience gained from a practical test of the methods, after they have been tried out to a considerable extent.

It is necessary not only to record the details of installations, but to summarize that information both as to quantities and costs. With the large number of units of the same kind, which are not recorded individually, it is necessary to secure unit costs, and the only way to secure such unit costs is to combine the quantities and the costs.

It should be borne in mind that one of the most important uses for these figures is in the supplying of proper information for the retirement of property. Consequently, the suggested groupings have been made with this in view. The matters will be taken up under the property accounts of the uniform classification.

Transformers and Other Devices and Transformer Installation

A very satisfactory plan for dealing with transformers is to average all transformers of the same phase, voltage and size. With this plan it is necessary to secure periodically the number of transformers of similar phase, voltage and size added during the period; get the corresponding cost of these transformers and add both numbers and cost to the total of each group of the system at the beginning of the period. The resultant value, divided by the total number of transformers in that group, will then give the average value at which retirements should be made. In that way such a value is always available. An individual card record is necessary to keep track of the data regarding the transformer, its location, tests, etc., and that card record should agree with the summary of the cost record in quantities.

"Other Devices" charged to this account should have an individual record unless the quantity is sufficient to justify the method suggested above for transformers.

Table I illustrates the above method.

TABLE I.—Typical transformer segregation and classification. Primary 2,500-v., single-phase

	5-kw. Transformers			7½-kw. Transformers		
	No.	Amt.	Avg.	No.	Amt.	Avg.
Total 1-1-25.....	275	$8,250.00	$30.00	90	$4,050.00	$45.00
Jan., 1925.....	8	249.92	31.24	3	131.25	43.75
Total 2-1-25.....	283	$8,499.92	$30.03	93	$4,181.25	$44.96
Feb., 1925.....	4	128.00	32.00	2	88.00	44.00
Total 3-1-25.....	287	$8,627.92	$30.06	95	$4,269.25	$44.94

The total value of the items should equal the total of the transformer account.

Meters

The method described above is especially adapted to the summarizing of meters where such large numbers are involved. The total number of meters in each group by type, size, voltage and wires should correspond to the summary of quantities in the costs. In this way it is practicable to know just of what the meter account is composed and where the property is located.

Poles and Fixtures

In order to summarize the costs and quantities of materials charged to "Poles and Fixtures" in a practical way, the suggestion is made that the more important units be selected to be treated as units and that the less important material be considered as installation material. For an illustration, the total value in this account may be treated under (1) poles by sizes, (2) crossarms by sizes, (3) guys and anchors. The cost of each complete unit would consist of (a) cost of the unit by itself, (b) material used in installation of that unit, (c) labor used in the installation of that unit, and (d) cartage. It is not proposed to ask men in the field to segregate labor under these subdivisions. It is difficult enough to get proper segregations by major classifications. But it is quite possible to subdivide labor pertaining to this account between the units involved and do it as accurately as it would be done in the field.

Table II shows how this method may be applied.

This method of summarizing produces the necessary unit prices for the retirement of the principal classes of material. Minor items must necessarily be retired at prices in current use.

It is believed that the results thus obtained are as accurate in apportioning labor as would be secured from actual attempts to keep track of labor by the ordinary line foreman. The results attained by these methods have been tested out in actual experience in individual cases and they agree very closely.

Overhead Conductors

It is comparatively an easy matter to summarize conductors since the cost is so largely to be found in the bare cost of the wire. They can be grouped by sizes with the quantities in pounds or feet with their corresponding costs. Material used in installation can then be shown as installation material. Labor and cartage can be subdivided in proportion to the weight, as the cost of handling varies nearly always in proportion to the weight. Insulators can either be treated as installation material, excepting the expensive high-tension types, or separate divisions can be provided for them. Switches had better receive individual treatment unless they are so numerous as to justify treating them as a class and thereby averaging them.

Table III illustrates a method that may be used in summarizing conductors.

Overhead Services

Services are more difficult to summarize. It is quite necessary to know the average cost per service and also the average length per service. Yet since there are such wide variations it does not seem quite correct to retire any individual service at an average cost of services. Consequently, it seems the better way to summarize them by sizes of wire. The tabulation, though similar in form to that for overhead conductors, will be quite different in results because of the differences in installation.

Subway

There are many peculiar problems connected with subway costs which make them a difficult matter to handle. They are so largely out of sight and the conditions of their construction are seldom apparent. For that reason a more careful record is justified than in cases where construction is in plain view.

Ducts can best be carried by duct feet and averaged as such. Manholes can either be accounted for by their cubic capacity in connection with the cost of building them, or they may be handled individually. If the manholes are fairly well standardized, the averaging method probably will be satisfactory. Vaults and larger structures should be treated individually, if practicable. Handholes and distributor boxes can well be averaged.

An example may help to illustrate the methods:

Underground Conductors

Underground conductors can easily be summarized by sizes together with the cost of the cable, material used in installation, labor and cartage. Individual record should be kept of apparatus which may be considered a part of such conductors.

Underground Services

Underground services also present quite a problem. The services themselves are so widely different that an average cost means little. There are several reasons why an individual record should be kept of each service. Among such reasons are:

(1) Information regarding the service in case of destruction by fire.

(2) In case of sale.

(3) Proper safeguarding such of company's property as may be on the property of a customer.

On the other hand, when a service is retired, it is retired in the form of so much cable and so much pipe and other materials taken out. It depends largely upon local conditions as to what may be the best method of handling such records.

Table II.—Application of Poles and Fixtures unit classification method.

		Unit Material		Instal. Mat.		Labor		Cartage		Total	
	Qua.	Amt.	Per U	Amt.	Per U	Amt.	Per U	Amt.	Per U	Amt.	Per U
40-ft. pole	20	$200.00	$10.00	$40.00	$2.00	$120.00	$6.00	$20.00	$1.00	$420.00	$19.00
45-ft. pole	15	180.00	12.00	30.00	2.00	97.50	6.50	15.00	1.00	322.50	21.50
50-ft. pole	10	140.00	14.00	20.00	2.00	70.00	7.00	10.00	1.00	240.00	24.00
6-ft. c. arm	60	60.00	1.00	15.00	0.25	30.00	0.50	3.00	0.05	108.00	1.80
10-ft. c. arm	20	25.00	1.25	5.00	0.25	10.00	0.50	1.00	0.05	41.00	2.05
Patent anchors	3	12.00	4.00	3.00	1.00	6.00	2.00	1.50	0.50	22.50	7.50

TABLE III.—Example of Overhead Conductor summarization method.

	Qua.	Unit Cost		Instal. Mat.		Labor		Cartage		Total	
	lb.	Amt.	Per U	Amt.	Per U	Amt.	Per U	Amt.	Per U	Amt.	Per U
No. 2	1000	$250.00	$0.25	$10.00	$0.01	$30.00	$0.03	$10.00	$0.01	$300.00	$0.30
No. 4	500	120.00	0.24	5.00	0.01	15.00	0.03	5.00	0.01	145.00	0.29
No. 6	2000	500.00	0.25	20.00	0.01	60.00	0.03	20.00	0.01	600.00	0.30
Total	3500	$870.00	$0.249	$35.00	$0.01	$105.00	$0.03	$35.00	$0.01	$1045.00	$0.299
Type				INSULATORS							
12445	300	$750.00	$2.50	$15.00	$0.05	$30.00	$0.10	$6.00	$0.02	$801.00	$2.67
Type				SWITCHES							
2745 Pac. Elec., 21st & Main Sts.	1	$195.00	$195.00	$10.00	$10.00	$20.00	$20.00	$3.00	$3.00	$228.00	$228.00
Total	....	$1815.00	.....	$60.00	.....	$155.00	.....	$44.00	.....	$2074.00	.....

TABLE IV.—Example of Underground Cost Classification.

	Duct	Unit Cost		Instal. Mat'l		Labor		Cartage		Total	
	Feet	Amt.	Per U	Amt.	Per U	Amt.	Per U	Amt.	Per U	Amt.	Per U
				DUCTS							
Main St., 1st to 3rd	550	$44.00	$0.08	$55.00	$0.10	$66.00	$0.12	$11.00	$0.02	$176.00	$0.32
				MANHOLES							
	Qua.										
1st & Main, 2nd & Main	2	.....	.....	$250.00	$125.00	$300.00	$150.00	$20.00	$0.10	$570.00	$285.00
				HANDHOLES							
Main bet. 1st & 2nd	3	.....	.....	$90.00	$30.00	$135.00	$45.00	$6.00	$3.00	$231.00	$81.00
				PAVEMENT							
Main St., 1st to 2nd, Bitulithic 110 cu. yds.	....	$275.00	$2.50	$22.00	$0.20	$11.00	$0.10	.....	.....	$308.00	$2.80
Asphalt—50 cu. yds.	....	$150.00	$3.00	.....	.....	.....	.....	.....	.....	$150.00	$3.00
				VAULT							
3rd & Main Sts.	....	.....	.....	$400.00	$400.00	$350.00	$350.00	$50.00	$50.00	$800.00	$800.00

Accounts Payable Committee Report*

The activities of the accounts payable committee have been confined to the study of accounts payable problems of the smaller companies and the adaptability of tabulating machines to accounts payable.

At a group meeting held in Portland on Feb. 1, the advisability of using tabulating machines in accounts payable work was discussed at considerable length, along with other subjects.

Several companies in this section are using tabulating machines and are distributing their payrolls by this method, as well as writing pay checks from tabulated reports, and while none of these companies are using the machines in distributing vouchers to their sub-records, it was generally agreed that such a plan is feasible.

The reason for not accomplishing these latter named tasks by means of tabulating machines seems to be due to the fact that the companies now using tabulating equipment have their equipment loaded to capacity and that any further work will mean additional equipment.

This machine method is not recommended for small companies where volume is not cumbersome in any of the several phases of the work.

* **F. H. Anderson, Puget Sound Power & Light Company, chairman. Pacific Power & Light Company: H. S. Gaylord. Portland Electric Power Company: G. W. Robertson. Utah Power & Light Company: R. H. Jones.**

Accounts Receivable Committee Report*

This committee has confined its activities for the current association year to one subject with the idea in mind that concentration on one thing might enable it to accomplish something of a tangible nature; therefore, all our efforts have been expended in a study of customers' credits, particularly as directed to the new practice of "Interchange of credit information."

Our investigations disclosed that a few electric utilities and a large number of gas utilities situated in the extreme West and Northwest have already adopted the practice and that many companies are now seriously considering the matter. A hasty survey of the companies located in association territory divulges the following status of affairs:

Companies which have adopted the plan:

Northwestern Electric Company, Portland, Ore.
Portland Gas & Electric Company, Portland, Ore.
Portland Electric Power Company, Portland, Ore.

Companies which have agreed to adopt the plan in the near future:

Tacoma Gas & Fuel Company, Tacoma, Wash.
Mountain States Power Company, Albany, Wash.
Boise Gas Light & Coke Company, Boise, Idaho.
Eastern Oregon Light & Power Company, Baker, Ore.
Puget Sound Gas Company, Everett, Wash.
Olympia Gas Company, Tacoma, Wash.
Puget Sound Power & Light Company, Bellingham, Wash.
Pocatello Gas & Power Company, Pocatello, Idaho.

* **A. E. Janssen, Idaho Power Company, chairman. The California Oregon Power Company: C. A. Swigart. Portland Electric Power Company: W. H. Tillman. The Washington Water Power Company: V. G. Shinkle.**

Companies now considering adoption of plan:

Pacific Power & Light Company, Portland, Ore.
Puget Sound Power & Light Company, Seattle, Wash.
Idaho Power Company, Boise, Idaho.

We have not had an expression from all the utilities located in Northwestern territory; therefore, the above list is somewhat incomplete. It is quite plausible to assume that a number of other utilities have the matter under consideration at the present time.

The committee believes that most companies are more or less familiar with the operations of the credit plan; therefore, exhaustive detail is unnecessary. However, for the benefit of those companies which may be uninformed, we are outlining briefly the plan below. Reference is also made to a very complete treatise on this subject by a committee of the Accounting Section of The Pacific Gas Association in its report and recommendations on credit and collections submitted at the annual convention held in Portland during August, 1925.

When a new customer applies for service he is required to supply the following information:

Utility reference:
Company .....
City .....
Address served.....
When served.....

Personal reference:
Name .....
Address .....
Occupation .....
Name .....
Address .....
Occupation .....

Commercial reference (charge accounts):
Business house .....
Address served .....
Business house .....
Address served .....

The above appears on the back of the application for service. The "utility reference" is secured in order that a questionnaire may be sent to the utility from whom service was last received in order to ascertain the credit standing of the customer with the other utility. We are submitting below a sample of a form of questionnaire ordinarily used.

(Face of letter form)

Portland Electric Power Company
General Offices
Electric Building

Portland, Ore.....192.....
App. No.....

To.....
.....

Gentlemen:

We have received an application from.....
who claims to have been a customer of yours at.....

We would consider it a favor if you would fill in the information asked for on the reverse side hereof and return it to us in the inclosed stamped envelope. This information regarding applicant's past record will materially aid us, and will be considered confidential.

Yours very truly,

.....
Creditman.

Members of National Electric Light Association.
(over)

(Reverse of letter form)

Name of applicant.....
Customer at.....
Customer for.....from.....to.....

(Nature of Account)

Was guarantee deposit required.....How much?.....
Were bills promptly paid?.....Is final bill paid?.....
How much is still due by applicant on old account?.....
Did account require notices?.....
Remarks .....
.....
.....
Date..... .....
(Signed.)

This gives the contracting company immediate access to the past record of the customer and, if it proves unsatisfactory, the company may then be on its guard and at the same time exact a deposit in such amount as it is permissible to demand under its rules and regulations. Quite frequently the questionnaire proves the means of aiding the company to whom it is addressed in securing payment of a balance which the customer owed at the time relations were severed with the previous company.

The elementary principles of the plan described are simple and yet elastic enough to permit modification to suit local conditions of any company. If, in conjunction with the adoption of this plan, the practice of demanding deposits is eliminated to a large extent, a considerable saving in clerical work will result. The time spent in writing deposit receipts, recording and refunding them, incidental checking and balancing of accounts regularly, computation and payment of interest, etc., is an item of cost which merits consideration. Moreover, it can be considered as an offset to the time spent in securing credit information, which itself would be compensated for by the elimination of losses due to lack of deposits. Contact with the customer would be established on a more pleasant and agreeable basis, which factor is also worthy of consideration.

Inasmuch as interest is paid on deposits, the mere possession of cash derived from customer deposits is of very little, if any, value. The value of this new plan is more or less dependent on the discontinuance of the practice of securing deposits at the time service is requested, and is probably more adaptable to residence accounts than to other classes of service. Industrial accounts must be carefully considered before the deposit is entirely eliminated.

There may be an impression that it will be necessary to form a separate credit department to place the plan in operation. Such is not the case, as the plan easily fits in to the regular routine of any office and requires no special department. The practice assumes particular importance in relation to merchandise activities, in which most companies are now engaged. Installment sales are steadily increasing and to insure ultimate collection of such accounts, the credit rating of the customer is highly desirable information.

The complete success of interchange of credit information among utilities hinges to a large extent upon the general adoption of the practice by all companies; however, the investigation of this committee develops the fact that there is some objection to the discontinuance of deposits by customers in view of the delay incident to confirmation of credit and that considerable antagonism might be stirred up among those customers whose credit would not be satisfactorily established. In view of this situation this committee has refrained from stating any definite conclusions, but it feels that the practice has sufficient merit to warrant further investigation by the new members of this committee during the ensuing association year.

Statistical Methods Committee Report*

In submitting this report it must be remembered pioneering this subject has been somewhat difficult, hampered as the committee was by the lack of interchange of views and the further fact that it had embarked upon a very involved and indefinite subject. However, with such opinions as were expressed at the February meeting and certain studies made, the committee makes the following recommendations as to the kind of statistics believed to be most desirable, together with definitions of the terminology contained therein. The manner of compiling the statistics, whether in numerical or graphical form, is left to the discretion of each utility.

It should be understood that all statistics refer to yearly totals, making the comparisons of one year with another cover a 24 months' period. For the sake of convenience these apply only to an electric utility.

Revenues

(1) Gross from sales of electricity. (Total and by classes.)
(2) Gross from other operations.
(3) Gross per total kw-hr. sold and by revenue classes.
(4) Gross per dollar of fixed capital.

Operating Expenses

Production

(1) Expenses of steam and hydro plants (excluding current purchased.) (a/c 701 to 708.4 inc. National Association of Railway and Utility Commissioners classification of accounts.)
(2) Kw-hr. generated by each.
(3) Per kw-hr. generated.
(4) Fuel costs of each plant,—total and per unit, barrel, ton or other measurement.
(5) Fuel costs per kw-hr.
(6) Load factor of plants.
(7) Capacity of plants, (i.e., maximum hourly load).
(8) Kw-hr. purchased.
(9) Expense of current purchased.
(10) Cost per kw-hr.

Transmission

(1) Miles of line, different voltages.
(2) Capacity lines carry. Maximum kw. designed for.
(3) Operating expenses and maintenance.

Distribution

(1) Number of meters.
(2) Number of consumers by classes. (Power consumers should be segregated by industries.)
(3) Kw-hr. sold to each class.
(4) Connected load of each class.
(5) Kw-hr. per consumer each class.

Utilization

(1) Number of ranges in service.
(2) Maintenance cost of same.
(3) Cost of maintenance per range.

Commercial Expenses

(1) Total commercial expenses.
(2) Number of consumers.
(3) Expense per consumer.

New Business Expenses

(1) Total new business expenses.
(2) Gross electric sales.
(3) Expense per dollar of sales.

General and Miscellaneous Expenses

(1) Total expenses (excluding taxes).
(2) All preceding expenses.
(3) Per cent of preceding expenses.

Taxes

(1) All taxes.
(2) As a per cent of fixed capital.
(3) As a per cent of gross sales.

Financial

Bonds

(1) Net operating income.
(2) Bond and other interest.
(3) Number of times income equals interest.

Preferred Stock

(1) Net surplus before depreciation.
(2) Preferred stock dividends.
(3) Number of times net surplus equals preferred stock dividends.
Amount of outstanding bonds.
Amount of preferred stocks.
Amount of common stocks.

General Statistics—kw-hr.

Steam output.
Hydro output.
Purchased energy.
Total.
Sold to public.
Used by company.
Unaccounted for.
Total.
Maximum demand.
Load factor.

Fixed Capital

(1) Production.
(2) Transmission (inc. substations).
(3) Distribution (inc. substations).
Total.

Note:—Overhead and other indirect capital to be prorated to the above subdivisions so that the sum of these divisions equals the total capital as shown by records.

Disposition of One Dollar of Revenue

Best shown on a circular percentage chart, showing portion of one dollar utilized by the utility for fuel, labor, materials, taxes, interest, depreciation and dividends, the last two being combined in some utilities as surplus.

Definition of Terms

Gross Sales—The total amount billed to consumers, the collection of bills and discounts for prompt payment being an individual company matter.

Kw-hr. Generated—Kw-hr. recorded on station meters before deducting the amount used in station for company uses.

Transmission—Operating expenses and maintenance comprise accounts 731 to 731.54, inclusive.

Other terminology is self-explanatory.

While many other items could be reported, the above cover the principal phases of public utility operations generally called for in the many questionnaires solicited. We believe they should be of great value from the standpoint of uniformity and also for comparative purposes, which in the end is the matter of most importance.

* **Wm. H. Hawkes**, Puget Sound Power & Light Company, chairman. **D. F. McCurrach**, Northwestern Electric Company, vice-chairman. **Portland Electric Power Company:** E. W. Moreland, A. H. Morris. **The Washington Water Power Company:** C. E. Gieseker.

Commercial Section Reports

Executive Committee Report*

The Commercial Section executive committee held its first meeting, after being organized, at Portland, Dec. 3, 1925, and all committees were represented. At this meeting the various committee chairmen reported progress and outlined their plans for the report for the 1926 convention. After discussing the various committee subjects in considerable detail, the advisability and desirability of holding a mid-winter session in February was discussed to considerable extent. It was pointed out that the Commercial Section had never held a sectional conference and that there was a need for such a meeting at which informal discus-

* **P. M. Parry**, Utah Power & Light Company, chairman. **The California Oregon Power Company:** W. M. Shepard. **Idaho Power Company:** J. F. Orr. **Pacific Power & Light Company:** V. H. Moon. **Portland Electric Power Company:** A. C. McMicken, J. D. Scott. **Utah Power & Light Company:** R. H. Ashworth. **The Washington Water Power Company:** L. A. Lewis, R. B. McElroy.

sions could be held upon the various subjects involving the attention and consideration of commercial men and permitting of free exchange of ideas and experiences in handling various problems. The result of this was the meeting which was held in Spokane, Feb. 18-19, at which were present representatives from all the states in the Section and practically all of the central stations in them.

A definite program was prepared in advance in which each chairman of the various Commercial Section committees was asked to lead the discussion for his committee.

The address of welcome was given by V. G. Shinkle, secretary and treasurer of The Washington Water Power Company. Response was made by A. C. McMicken, sales manager of the Portland Electric Power Company, and the outline and purpose of the meeting was given by P. M. Parry, chairman of the Commercial Section.

Electric Refrigeration

The subject of electric refrigeration was discussed by Geo. C. Sawyer, sales manager of the Pacific Power & Light Company. Because this is one of the newer subjects a great deal of discussion resulted regarding the various angles of developing the electric refrigeration load, and a number of very good ideas for the advancement of domestic electric refrigeration, and sales methods used and found to produce satisfactory results, were brought out.

After a thorough discussion of this subject the following resolutions were adopted:

RESOLUTION

At the mid-winter conference of the Commercial Section of the Northwest Electric Light and Power Association held at Spokane, Wash., Feb. 18-19, 1926, a major part of the program was devoted to discussing ways and means of promoting the sale and use of domestic refrigerating equipment; and,

Whereas, It was the consensus of opinion that the ownership and use of domestic refrigerators by power company employes is vital to the sale of this equipment. Now, therefore, be it

Resolved, That the power companies and manufacturers cooperate to the extent of eliminating all items of profit and make possible the placing of domestic refrigeration equipment in the homes of company employees at actual manufacturers' costs.

Copies of the foregoing resolution have been sent to the principal manufacturers of domestic electric refrigerators.

RESOLUTION

To the Executive Committee of the Northwest Electric Light and Power Association:

Whereas, The Commercial Section of the association at its mid-winter conference in Spokane, Wash., Feb. 18-19, 1926, discussed, among other matters, the building of a domestic refrigeration load and its relation to the commercial ice industry, and

Whereas, The matter of advertising domestic refrigeration and its relation to the commercial ice industry was discussed. Therefore, be it

Resolved, That the Commercial Section recommend to the Executive Committee that it request all member companies advertising and selling domestic refrigerating equipment to so conduct their advertising and sales activities as to give the impression of promoting domestic refrigeration in general and not specify "domestic electric refrigeration" since this would immediately antagonize the commercial ice industry.

Other Committee Reports

Electric heating and cooking was discussed by Ross B. McElroy, chairman of that committee for this year, after which there was extended discussion, both as to methods of developing the business and as to the form of report to be prepared for the June convention.

The merchandising committee was represented by V. H. Moon, chairman, who compared the results of several campaigns which had proved successful in developing commercial and residential lighting loads. The experiences of a number of other companies represented were given, showing the methods adopted and the results obtained.

Power sales activities and new uses for power were discussed by J. D. Scott, chairman of the power committee, who reviewed the activities of his committee and outlined the various sources from which additional revenue might be secured. A discussion followed which brought out the various methods and plans adopted by a number of companies in the securing of new power loads in connection with industrial heating and baking.

Rural electrification was discussed by L. A. McArthur, in which he described the development of rural electrification, with particular reference to Oregon, showing the progress of the National Committee's work along these lines. An extensive discussion followed, in which the activities in rural electrification in the Northwest Section were clearly brought out. The possibilities of the business were shown also, together with the probable estimated cost of securing complete electrification of the rural sections. Dean Edward C. Johnson, director of the experimental farm at the Washington State College, gave a very interesting paper describing the experiments conducted at the Washington State College in conection with farm electrification.

Range Survey Reported

Lewis A. Lewis, chairman of the committee on the subject, presented a report on the results obtained in the national electric range survey. A number of lantern slides were used to show the results of the committee's work to date, which gave the amount of load for various classes and combinations of service, including the range load, range and water heating load, and range, water heating and appliance load. The effect of such loads could be estimated for each company by superimposing such curves upon the load curves of any central station, thereby determining what effect this type of business would have upon that system.

L. R. Lefferson of the Electric Bond and Share Company, New York, gave a talk on rate making, showing the various types of rates applicable and explaining the theory of rate making in detail. The rate question was discussed generally, and the weaknesses and advantages of the various types of rates were brought out.

W. R. Putnam, representing E. W. Lloyd, chairman of the National Commercial Section, gave a talk on the activities of the national association and outlined the objects and aims to be accomplished during the year.

After the close of the two-day session, it seemed to be the unanimous opinion that the session had been well worth while and that many good ideas had been developed which could be taken home and put into practical use. The enthusiasm developed was undoubtedly carried back by those present and we feel sure that the result of this meeting will be a demand for similar meetings in the future at which free and informal discussions may be held regarding all topics covered by this Section.

The attendance at this meeting was approximately one hundred.

The Commercial Section was represented at the National Commercial Section meetings held in Chicago Oct. 13-14 and Jan. 14-15.

Committee reports have been prepared for presentation at the Spokane convention as follows:

Electric Cooking and Heating Committee: Ross B. McElroy, chairman, The Washington Water Power Company, Spokane, Wash.

Power Committee: J. D. Scott, chairman, Portland Electric Power Company, Portland, Ore.

Domestic Electric Refrigeration Committee: J. F. Orr, chairman, Idaho Power Company, Boise, Idaho.

Merchandising Committee: V. H. Moon, chairman, Pacific Power & Light Company, Portland, Ore.

Transportation Committee: R. H. Ashworth, chairman, Utah Power & Light Company, Salt Lake City, Utah.

Electric Range Survey Committee: Lewis A. Lewis, chairman, The Washington Water Power Company, Spokane, Wash.

The above includes all committees with the exception of the Customers' Relations Committee. A. C. McMicken, chairman of this committee, felt that there was nothing new to be developed in a report for this year because of the fact that the work of this committee so closely followed, and in fact apparently duplicated, the work of the Public Relations Section Committee in many ways. It was therefore decided that for this year no report would be made.

Domestic Refrigeration Committee Report*

The report submitted by the domestic electric refrigeration committee of this Section for 1925 dealt with this subject as related to our territory in considerable detail. The committee recommends the careful study of this report and it also recommends for study the report on preservation of food, as given by Mr. McLay, a member of the electric refrigeration committee of the National Electric Light Association for 1925. This report should be read and studied by everyone interested in the sale of domestic refrigerators.

We are quoting the more general part of this report:

The chief object of refrigeration is to prevent the spoiling of foods, and in order to lay a proper foundation for its study and fully appreciate its importance to man's welfare, we should first investigate the causes leading to spoiling, decomposition and decay.

It is only since the invention of the microscope we have learned that by far the most numerous and widespread of all living things are minute colorless plants called micro-organisms or microbes. They are found everywhere—in the water, in the air, in the soil, and on all growing and living things. They require for their food the same material as man and a constant warfare exists between the two for its possession.

There are many kinds of microbes. Though called plants, many are like animals in that they possess the power of locomotion. Some actually are animals, e.g., the Protozoa. Some are harmful to human health and are called disease germs. These, however, are comparatively few in number because very few microbes live in a healthy living animal. Many are useful. The delicate flavoring of butter and cheese is due to the action of certain micro-organisms, also the seasoning of meat. Others cause the raising of bread and the fermenting of liquors. They all contribute to the decomposition and final decay of dead organic matter, reducing it to the dust and soil to form the elements for new growth. The various kinds of microbes are always at war among themselves for the possession of food, and the kind of spoiling which occurs will usually indicate which group won. They multiply with enormous rapidity, and it is only this antagonism, and various other influences which prevent them from devouring all things and then dying themselves for lack of food.

Microbes, in their normal state, exist as small unicellular colorless plants; they also exist in the so-called "resting stage," a condition analogous to seeds of our larger plants. The normal growing microbe can easily be killed by pasteurization, that is, subjection to a temperature of 140 deg. to 160 deg., but the one in the resting state is harder to affect and will sometimes withstand pasteurization temperatures for a long time. Many of them multiply merely by elongating and dividing into two, as often as every 20 or 30 minutes. Others form "spores" something like seeds of larger plants. These spores have a high resistance to heat and cold. They are floating about everywhere and when one falls into fertile soil—organic matter with plenty of moisture and warmth—it immediately becomes active, grows and commences to propagate its kind.

The function of refrigeration is to prevent growth or multiplication of microbes, since they will not grow at low temperatures. They are not destroyed, however, by cold and will immediately become active and grow and multiply again when the temperature is increased.

Sales Manual

The central stations of the Northwest as do others throughout the countrty realize the value of the domestic refrigerator load and are all much concerned in ways for increasing the sales of this machine. It is for this reason that this committee has been interested in the preparation of a domestic refrigeration sales manual that can be used by those engaged in selling this class of service. Many of the refrigerator manufacturers have put out a course in salesmanship, and while these deal largely with the sale of a particular line of merchandise, yet the committee recommends that anyone engaged in selling electric refrigeration would do well to enroll in one of these courses.

Selling refrigerators consists of selling an idea and not necessarily a machine, and the best success can be obtained if sales efforts are preceded by an educational campaign. To successfully sell refrigerators, then, means that we must adopt some educational plan that will reach our customers. Some companies have been successful in using a selected mailing list, others in general newspaper and billboard advertising.

Co-operation with Architects and Builders

It is to be noted that the tendency in designing modern homes is to provide kitchens of limited size, the cabinet type kitchen being most generally used.

Inspection of many new buildings under construction reveals the fact that in a great many instances, even in homes of the better class, practically no space is left in the kitchen, or immediately adjoining the kitchen, for a refrigerator of suitable size.

This committee feels that member companies could well address letters to the architects and builders in their respective territories calling attention to the tremendous growth of electric refrigeration for the home now taking place, which growth is destined to continue in the future, and request that in designing and building homes ample space be allowed, preferably in the kitchen, for the placing of a refrigerator.

It should also be borne in mind that the average householder, when installing an electric refrigerator, will provide a refrigerator of larger capacity than when using ice, and due regard should be given to this phase of the situation.

Builders and architects should be advised that the cabinet effect in the kitchens they plan may be preserved and refrigeration properly cared for by building a standard make of refrigerator into the wall of the kitchen, allowing the back of the refrigerator to extend into a hall or closed-in back porch. Their attention should be called, of course, to the fact that when refrigerators are built into the wall, the bottom of the refrigerator should be raised at least eighteen inches above the floor to provide greater convenience. They should further be advised of the desirability of carrying a drainage pipe from the refrigerator to the outside, or connecting it to a permanent drain, in order that defrosting may take place without inconvenience.

This committee believes that with but few exceptions builders should purchase refrigerators of standard make and known efficiency, rather than attempt to build them themselves.

In some sections of the country, builders are not only building refrigerators into the kitchen, but are installing electrical units as well. An excellent opening for the sales department in this connection exists undoubtedly.

Rates

It is found that a wide disparity of rates exists in connection with home electric refrigeration and that ideas of the rate departments of various central stations are widely at variance as regards proper classification of this type of business. This committee believes that considerable discussion might be engaged in to advantage on this subject particularly during the early stages of development as it is obviously difficult to make any major adjustments after a large amount of this business has been secured.

Some companies feel that refrigeration business should be taken on the regular combination lighting and cooking rates, which means, of course, that all of the refrigeration consumption would be on the low step. These companies feel that the customer develops into a high load factor customer and is entitled to his excess kw. hours at a low rate. Other companies feel that the value of the service rendered by a domestic refrigeration unit is far above this low step rate, and are of the opinion that some method must be devised to bill the customer at a price commensurate with the value of the service, either through additional steps in existing rates for customers using refrigeration, or if necessary, through an additional meter at a special refrigeration rate. These are matters which should receive the early consideration of member companies.

Cost of Servicing

Considerable reference has been made to discussions of refrigeration servicing costs and to various reports on the subject that have been compiled from time to time.

This committee calls attention to the fact that in compiling figures on the cost of servicing due consideration must be given the fact that the late types

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* J. F. Orr, Idaho Power Company, chairman. Pacific Power & Light Company: G. C. Sawyer. Puget Sound Power & Light Company: R. W. Clark. Utah Power & Light Company: H. M. Ferguson. The Washington Water Power Company: J. F. Farquhar.

of machines are giving far less cause for trouble than the earlier models. It is obviously not fair, in giving consideration to servicing and costs as a basis for future activity, to take into consideration the costs on all of the older machines in service.

Regard should also be taken of the fact that many companies choose to make a periodic inspection of all machines in service even though many of these visits do not result in adjustments of any sort. This expense, of course, can well be charged to development of this class of business, but cannot fairly be charged as cost of servicing in the event that no actual servicing takes place. It is the belief of this committee that if these points are given due consideration it will be found that the cost of servicing per machine per year will show a lower figure than has been submitted in a number of reports.

Some information has been obtained in response to questionnaires sent out to central stations operating in this division relative to service costs and kw-hr. consumption of the domestic refrigerator. These data, however, are practically the same as set forth in the report of the committee last year. At the present

Domestic Refrigeration Record and Service Data

Consumer _____

Address _____ City _____

Location of Unit _____

Model _____ Serial No. _____

Type of Condenser _____ Tank No. _____

Type of Fan _____ Fan Pully Inches _____

Size of Motor H. P. _____ Motor Mfgr. _____ Motor No. _____

Motor Pulley Inches _____ Compressor Pulley _____

Belt Size and Material _____

Installed by _____ Date _____

Make of Refrigerator _____ Total Cu. Ft. _____

Condition _____ In use _____ Years _____

Ice Compartment Width _____ Depth _____ Height _____

Meter Installed _____ Date _____

Date	Nature of Trouble	Cost of Material And Labor	Amount Billed Consumer

Fig. 1. Recommended uniform data card.

time there seem to be no uniform records being kept. This makes it impossible to secure data on service cost on a comparable basis. A suggested form of service and installation card was made by the committee last year and it is recommended that a uniform data card be adopted by all central stations of the Northwest. A suggested form is that which follows:

At a recent meeting of the Commercial Section of this division two resolutions were adopted in the interest of furthering the sale of electric refrigeration.

It was felt that a great hindrance to the promotion of the domestic refrigerator might be removed if a considerable number of the officials and employees of the central stations would use this appliance in their own homes, and it was agreed that the manufacturers of ice machines should offer some inducement which would assist in making this possible. The other resolution recommends that the executive committee of the association urge its member companies to conduct their selling and advertising campaigns so as not to antagonize the commercial ice manufacturers and that none try to build domestic refrigeration load at the expense of the commercial ice industry.

Electric Service Company	Residential Customers	Ranges in Use	Present % Saturation	% of Ranges Sold with Water Heaters	Kw-hr. used Monthly by Range	Are Ranges sold at M'fg List Price?	Discount Offered for Cash	Lowest Down Payment	Maximum Months of Payment	Use of Premiums	Forms of Advertising Used	Most effective Advertising Used	Ranges Sold Installed	Makes of Ranges Sold	Believe in Campaigns	Duration	How Many per Year	Cooking Rate per kw-hr.	Practice followed in selling Apartment Houses Ranges	Do you believe in other stores selling ranges?
A	61,867	7,000	11.3	18.0	150	Yes	5%	$15.00	31	Yes	Newspaper Billboards Broadsides Demonstrations	Demonstrations	Yes	Hotpoint Westinghouse Acorn	Yes	30 days	3 or 4	2c	Cost plus 15%—25% Down, 24 Payments. Connect to customers wiring.	Yes — with proper coaching.
B	12,000	3,263	27.2	12.0	125	Yes	5%	$14.50	18	Yes	Newspaper Broadsides Demonstrations	Newspaper	Yes	Universal Westinghouse Hotpoint Acorn Universal	Yes	6 weeks	4	2c	12 or more sold at 15% above cost—10% Down, balance 60 monthly payments.	Dealers are paid 15% commission—Dep't stores do not adher to selling plans. Furniture stores just becoming active.
C	30,361	2,421	8.0	50.0	142	No	5%	$10.00	18	Yes	Newspaper Broadsides Demonstrations	Newspaper	No	L & H Monarch Hotpoint Westinghouse Acorn	Yes	60 days	3	3.6c net	4 or more sold at 15% above delivered cost—Terms: 12 months, 5% charge.	Our experience is not satisfactory.
D	73,102	8,000	10.9	None	104	Yes	10%	$5.00	24	No	Newspaper Billboards Broadsides Demonstrations	Newspaper	No	Hotpoint Westinghouse	Occasionally	.....	.....	2.7c net	Large groups at laid down cost plus delivery. Terms: 2 years.	Yes—other stores selling ranges must service same.
E	23,000	5,860	25.5	33.0	127	Yes	10%	$5.00	24	Yes	Newspaper Billboards Broadsides Demonstrations	Newspaper	No	Hotpoint Westinghouse	Yes	30 days	4	2c	Additional quantity discount offered.	No.
F	33,000	7,038	21.3	97.0	122	Yes	10%	$4.00	24	Yes	Newspaper Billboards Broadsides Demonstrations	Newspaper	Yes	Westinghouse Hotpoint	Yes	6 weeks	2	3c	Customer pays complete cost plus carrying charges and does all wiring. Terms: 12 months.	Would like to have stores selling ranges of approved make but not same ranges sold by us. We would service on this basis.
G	73,000	10,000	12.8	25.0	115	No	5%	$10.00	18	Yes	Newspaper Billboards Broadsides Demonstrations	Newspaper	Yes	Westinghouse Hotpoint Acorn	Yes	60 days	2	2c	Cost plus 5%. Terms: 24 months.	No.

Table I.—Summary of questionnaires returned by seven power companies in Northwest geographic district. Part of report of Electric Cooking and Heating Committee appearing on following page.

Electric Cooking and Heating Committee Report*

The electric range and water heating committee held two meetings during the past year. The first was in Portland on Dec. 4, 1925, and the last in Spokane, Feb. 18, 1926.

When it is considered that the development of the electric range load has been an operating and merchandising problem before us for many years it appears that a comparison of methods used in building this load, and the progress that has been made, would be worthy of considerable study. In analyzing the comparative report, which is a summary of questionnaires returned by seven of the power companies in this geographic district, it is remarkable how closely in agreement they are in regard to individual range sales policies. See Table I on preceding page.

Territorial Saturation

The seven companies reporting serve 311,420 residential customers of which 43,582 are electric range users, a range saturation of 14 per cent. This percentage of saturation varies from 8 per cent to 27.2 per cent. Assuming 50 per cent range saturation, a reasonable figure to approach, most companies are only fairly started on range load building.

Electric Range Monthly Kw-hr. Consumption

Since most companies do not meter the electric range separately these figures are simply the closest approximation. The average monthly use of 126 kw-hr. appears reasonable. This figure multiplied by the particular rate that applies shows what the range is worth to a company as a revenue builder. The cooking rate as shown in the summary varies from 2 to 3.6c per kw-hr. In most cases these amounts are the lowest step of the combined lighting and cooking rate.

Selling Plans

Nearly all of the companies reporting sell electric ranges at the manufacturers' list price and terms with 5 or 10 per cent discount for cash. The terms of monthly payments usually are extended over approximately 24 months. All the companies believe in a small down payment and the majority favor selling the range completely installed ready to use.

Newspapers, billboards, broadsides and demonstrations are the forms of advertising generally employed by most companies. The newspaper is favored as the most effective method. Two or three short campaigns of from 30 to 60 days each is the popular way to sell the range by most companies, at which time the use of a premium is considered effective.

That the power company should carry two lines of electric ranges is unanimous yet some carry five or six lines, probably due to local conditions.

All companies reporting sell ranges to apartment houses in quantities of four or more at approximately cost price plus a carrying charge for deferred payments.

The sale of ranges by electrical dealers, department stores, furniture stores, hardware stores, etc., seems to be a question that has as many different opinions as there are power companies. However, the predominating thought is that this class of dealers is not at present prepared to sell the electric range and service it as desired by most electric service companies.

Electric Water Heating

Most companies sell the electric water heater but do not insist upon the purchase of a heater at the time the range is installed. From the customer's viewpoint, the flat-rate charge for this service seems most popular. This committee regrets that it did not have the opportunity to make an exhaustive study of high-wattage metered-water-heating service, but this was impossible because so few of these water heaters now are in use in the Northwest. The committee hopes that this study as outlined by the Commercial National Section will be undertaken at the earliest possible date.

This report is presented by the committee with the desire that some phases of the electric range and water heating load will be of value to all concerned.

* R. B. McElroy, The Washington Water Power Company, chairman. Idaho Power Company: G. H. Davis. Northwestern Electric Company: J. B. Buman. Pacific Power & Light Company: G. C. Sawyer. Portland Electric Power Company: H. A. Joslin. Puget Sound Power Company: R. W. Lindley. Utah Power & Light Company: R. M. Bleak.

Electric Range Survey Committee Report*

Editor's Note: This constitutes a summary of N.E.L.A. reports No. 25-41 and No. 256-38, both of which may be obtained from the National Electric Light Association, 29 West 39th Street, New York, N. Y. In this brief review only the salient features of the committee's final report are presented. Copies of the complete report will be distributed free of charge at the Spokane convention of the Northwest Electric Light and Power Association.

With the increasing popularity of the electric range and the increasing willingness on the part of central stations to furnish this service, there has arisen a necessity for the determination of certain data which will enable the allocation of that part of a utility's investment in plant, transmission and distribution facilities properly chargeable to range load. In order to arrive at this figure an extensive series of tests is required to furnish data from which proper deductions can be made. With reliable and authentic information at hand it is felt that those electric service companies that have been more or less reluctant to encourage the use of electric ranges will be able to apply the data to their own systems and from it work out a plan, so that ultimately electric cooking will become universal.

In order to obtain the necessary data the electric-range survey committee was appointed as a sub-committe of the national cooking and heating committee. Funds to finance the survey were provided by the electric range manufacturers in co-operation with the N.E.L.A. On account of development of the electric range load in the Pacific Northwest the task of making these tests was assigned to the Northwest Electric Light and Power Association. The committee originally appointed in the fall of 1923 has been working almost continuously since that time on various phases of the tests. The actual tests upon which the present and final report of this committee is based were made during the period from March, 1925, to February, 1926.

Where Tests Were Made

The work of the committee has been confined to the making of a series of tests on 150 ranges in two different localities, an urban and a rural community. The tests covered three seasons of the year for each community; the urban tests being for spring, summer and winter with the fall omitted since it was believed that the spring tests would be comparable with the fall tests. The rural tests covered the seasons of summer, fall and winter.

The city of Spokane, Wash., was chosen as representative of an average urban community. With its high density of electric range load it was believed to be extremely ideal for the particular tests to be made. Spokane with a population of some 115,000 is one of the principal cities of the Northwest, with the manufacture of wood products as its chief industry. In that city the residential consumer's service is supplied through one meter. This single meter registers the consumption of energy used for lights, appliances and

* L. A. Lewis, The Washington Water Power Company, chairman. Idaho Power Company: F. J. Rankin. Puget Sound Power & Light Company: M. T. Crawford. The Washington Water Power Company: L. R. Gamble.

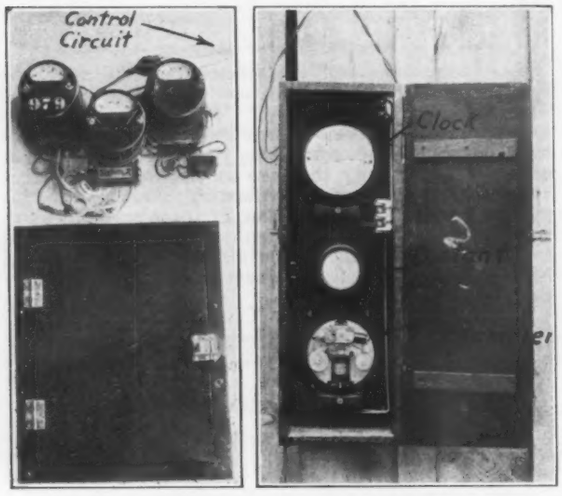
the electric range. The water heater is on a flat rate and is connected to the service ahead of the meter.

The towns of Payette, Idaho, and Ontario, Ore., were chosen as being representative of the average

Typical street in Payette, Idaho, showing types of homes where surveys were made.

rural community and also because of their location with respect to each other, making it easy to test 150 ranges without covering too much territory. Payette has a population of 2,500 and Ontario, 2,000. The two towns are about four miles distant and situated on opposite banks of the Snake River. The consumers on the outer edge of these towns are chiefly farmers on small irrigated fruit ranches. The consumers in the towns themselves are owners and clerks in the stores, professional men and retired farmers.

The rate schedules of the central station serving this territory require three separate meters, one on the range, one on the lighting service and one on the water-heater service. The difference in rates for each service makes it advantageous for the consumer to



Meters and panel board in Payette home (left). Distant dial set showing clock, dial and printometer (right).

use his appliances such as electric irons, toasters, etc., on the range circuit. Therefore the range tests, in general, reflect the demand and kilowatt-hour consumption for the range and heating appliances while the lighting tests give these factors for lighting and appliances which use small amounts of power. It is felt, however, that the range peak is very little affected due to such small heating appliances being rarely used when the range is in service.

Method Used in Making Tests

The procedure followed in making the tests is known as the distant-dial method. The distant dial is an instrument by means of which the energy registered on any number of watthour meters is totalized. This dial, which is actuated through a low-voltage direct-current control circuit, may be placed at any reasonable distance from the watthour meters. For purposes of accuracy only ten watthour meters were connected to each distant-dial set, making 15 sets of instruments necessary.

Standard watthour meters were used in making the tests. These were equipped with commutator-type reversing switches to actuate the distant dial.

Since the distant dial in itself does not have any time-interval element it was necessary to equip it with contacts so that a printometer could be installed and the demand in kilowatts obtained. The printometer with its auxiliary, a Warren motor-driven contact-making clock was used for this purpose. The clock had a 15-min. demand interval.

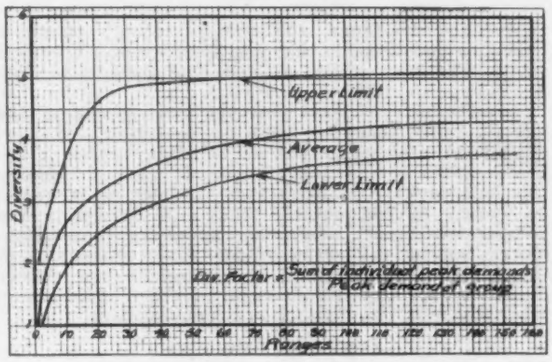


Fig. 1. Curve showing diversity factor for electric ranges.

During the time of each seasonal test the following demands were recorded:

1. Range demand.
2. Water-heater demand.
3. Lighting and appliance demand.
4. Total residential demand.

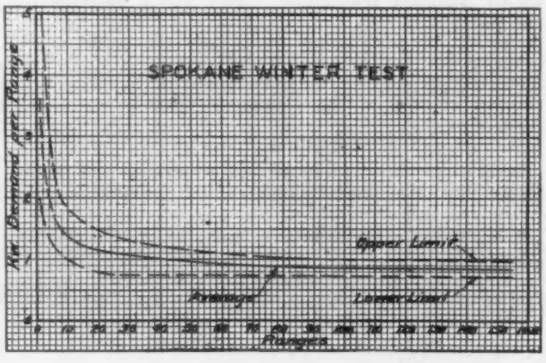


Fig. 2. Curve showing the kilowatt demand per range for urban winter conditions.

The following time was allotted for the individual tests:

Range test	14 days
Cutting meters to water heater circuits	3 days
Water heater test	7 days
Cutting meters to lighting and appliance load	3 days
Lighting and appliance load test	7 days
Cutting meters to total residence load	3 days
Total residence load test	7 days
Total	44 days

Upon the completion of the tests the committee was able to arrive at certain deductions and to present results giving definite information regarding the characteristics of the electric range load. In its conclusions no attempt is made to determine whether or not the electric range load is a profitable business, since this is beyond the scope of the work assigned to the committee. However, it is expected that the information secured by the committee will furnish the electrical industry as a whole the fundamentals upon which to base an anlysis. With a foundation on which to build, any electric service company then can apply the constants of its particular system and deduce results for use in solving the problem of the rate to be charged to make the range load pay. Such rates, of course, can be expected to vary for different sections of the country and in many instances will be influenced by the cost of cooking by other methods.

It can be seen readily that the committee cannot go into the matter of whether or not the electric range load is profitable, because of the large number of variable factors that enter into the problem and each factor having a different weight and value for each individual utility. Therefore the committee has attempted to supply only those fundamentals which will remain practically constant under all conditions.

Conclusions*

With the data made available by the field survey of electric ranges the following facts have been determined:

1. Average peak demand for one electric range in either urban or rural communities is approximately 3.61 kw. The maximum peak demand is approximately the connected load of the range.

2. Power demand per range for groups of 50 ranges to groups of 5,000 ranges is from 0.950 kw. to 0.700 kw. for urban communities, and from 1.000 kw. to 0.712 kw. for rural communities.

3. Power demand per range for a certain number of ranges in a group does not vary perceptibly for the two types of communities or for the seasons of the year. In the urban territory the power demand per range for a group of 150 ranges varies from 0.88 to 0.84 kw. The lower demand was obtained from the winter test. For the rural community the power demand varies from 0.87 kw. to 0.83 kw. The lower demand was obtained from the summer test.

4. Typical range-load curves for both communities show three distinctive peaks, one in the morning, varying from 7:30 to 8:00 a.m., one at noon, and one in the evening, varying from 5:30 to 6:00 p.m. In the urban community the evening peak is the greatest for all seasons of the year, the morning and noon peaks being from 50 to 65 per cent and 45 to 60 per cent respectively of the evening peak. The evening peak comes between 5:45 and 6:00 p.m. during all seasons of the year except the winter season, then it comes 15 min. earlier. In the rural community the noon and evening peaks are about equal, the noon peak generally being the largest for all seasons. The morning peak is from 60 to 70 per cent of the noon or evening peak.

5. Due to the fact that in the temperate zone the days are considerably shorter during the winter months it was found that the lighting peak moves forward and tends to coincide with the range peak. The lighting peak for both communities during the winter occurs between 6:15 and 6:30 p.m. Although this is somewhat later than the range peak it is found that there is 74 per cent of the range peak on, for the urban community, and 60 per cent of the range peak on, for the rural community, at the time of the lighting peak. During the range peak between 94 and 98 per cent of the lighting peak is on for the urban and rural communities respectively.

6. Power demand per range at the time of the winter lighting peak in urban territory is 0.62 kw. per range based on 150 ranges and in rural territory 0.50 kw. per range.

7. Average annual power consumption per range for both communities is practically the same, varying between 1,500 and 1,600 kw-hr.

8. Average peak demand for any one light-and-appliance consumer in either urban or rural territory is about 0.600 kw.

9. Power demand for a group of 150 consumers in an urban community during the winter season is 0.242 kw. per consumer and in a rural community is 0.174 kw. per consumer.

10. Power demand per consumer for light and appliances during the winter range peak in urban territory is 0.230 kw. based on 150 consumers and in rural territory on the same basis is 0.168 kw. per consumer.

11. Average annual power consumption per light-and-appliance consumer is about 375 kw-hr., for each community.

12. Although the following data on water-heater loads are conclusive as far as the type and size of water heater are concerned, the committee is anxious to emphasize the fact that they are not representative of the entire water-heater situation since only heaters of low wattage were tested. The maximum size in any instance was but 1 kw. It is understood that further tests will be run during the coming year involving water heaters of larger capacities. The tests of this committee supplementing those to be made will provide data upon which to make more definite conclusions. The water heaters in Spokane are on a flat

* **Note:** The demands given throughout this report are at the consumer's service switch so that when such demands are referred back to the points of supply the losses in transmission must be added. All reference to lighting and appliance load should be taken to mean the residential load exclusive of the range and water heater.

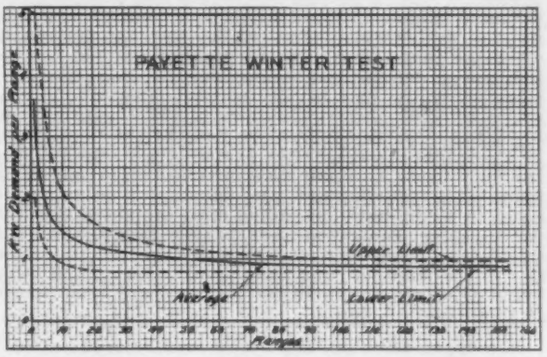


Fig. 3. Curve showing kilowatt demand per range for rural winter conditions.

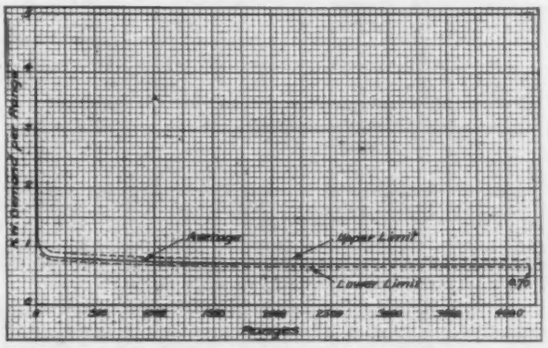


Fig. 4. Curve showing the kilowatt demand per range up to 5,000 ranges.

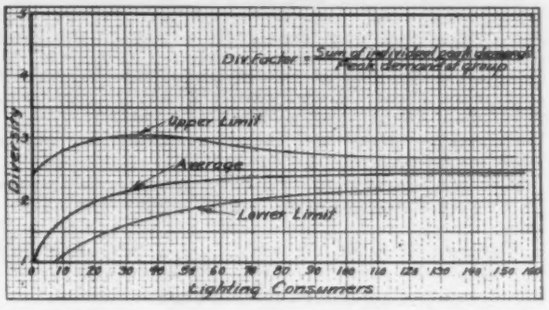


Fig. 5. Curve showing the diversity factor for a group of lighting consumers.

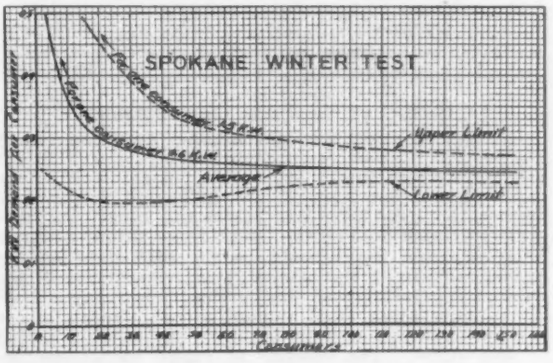


Fig. 6. Curve showing the kilowatt demand per consumer for lights and appliances for urban winter conditions.

rate and so connected to the range service that the heater is off when the range ovens are used. The tests show the demand per heater, on the basis of 150 heaters, to be 0.761 kw., with practically no diversity for larger numbers of heaters. The demand at the time of the evening range peak is 0.599 kw., for 150 heaters, dropping to a demand of 0.540 kw. for 5,000 heaters.

Water heaters in Payette are on a metered rate with no arrangement made for taking them off the circuit when the range is in use. On the basis of 150 heaters the power demand per heater is 0.75 kw. There is some diversity due to the metered rate and for a group of 5,000 heaters the demand per heater falls to 0.695 kw. The demand at the time of the noon range peak, on the basis of 150 heaters, is 0.585 kw. per heater. There is some diversity here also and it is found that the demand per heater for a group of 5,000 is 0.538 kw. No curve was computed for the water-heater demand at the evening range peak, but calculations show that the diversity will be the same as in the case of the noon peak although it was found that the water-heater peak generally is lower at that time of day.

13. Diversity factors for ranges were found to be as follows:

10 ranges	2.65
20 ranges	3.13
30 ranges	3.42
40 ranges	3.63
50 ranges	3.78
75 ranges	4.05
100 ranges	4.18
150 ranges	4.30
1,000 ranges	4.85
5,000 ranges	5.15

14. Connected load of the range has no material bearing upon the peak demands created by a group of ranges. This is evident from the fact that the peak demands in the two communities were the same, while the urban connected load averaged 7.140 kw. to the rural conected load of 5.744 kw. per range.

15. Power demand per consumer during the winter season for a group of 150 consumers without water heaters is 1.06 kw. for urban districts and 1.008 kw. for rural districts. With water heaters these values are 1.57 kw. and 1.528 kw. respectively.

16. Demands recorded during the tests were for ranges, etc., that were in active use. There were some consumers who, during the period of the tests, did not consume any energy and therefore were not included in arriving at the demand. Based upon 150 consumers it was found that the active consumers were about 98 per cent of the total under test.

17. Range peaks may be expected any day of the week except Saturday or Sunday.

18. Load factors for the various types of service on a weekly basis for a 15-min. period are as follows:

For ranges in urban territory	16 to 18 per cent
For ranges in rural territory	21 to 23 per cent
For lights and appliances in urban territory	25 to 32 per cent
For lights and appliances in rural territory	18 to 26 per cent
For total load without water heater in urban territory	21 per cent
For total load without water heater in rural territory	23 per cent

Method of Applying Data Obtained

In order to apply the data obtained from the survey the central station desiring to supply a service for electric cooking first must obtain certain load curves from the system, namely, the individual feeder load curves, the substation load curve and lastly, the generating-station load curve. With these curves at hand, which, by the way, should be for such days as are representative of the annual peak conditions of the various subdivisions of the service, the utility should set a figure as to what number of new electric range consumers it will attempt to serve, say, after a period of five years. The number of range consumers determined, the next step will be to add to the feeder-load curves the range-load curve for the number of ranges expected to be taken care of by each particular feeder. (See Fig. 7.) Should the water heater be

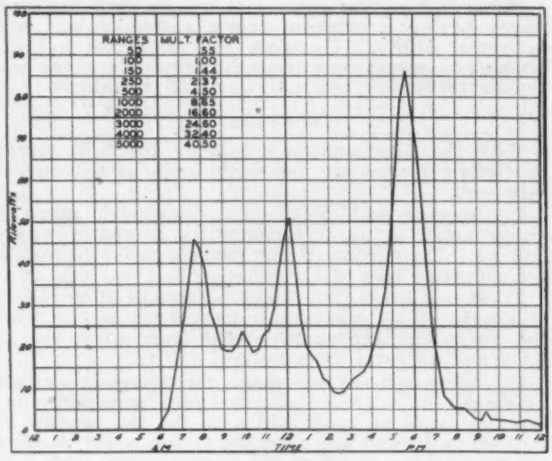


Fig. 7. Typical electric range load curve for an urban community for 100 ranges with multiplication factors for groups of from 50 to 5,000 ranges.

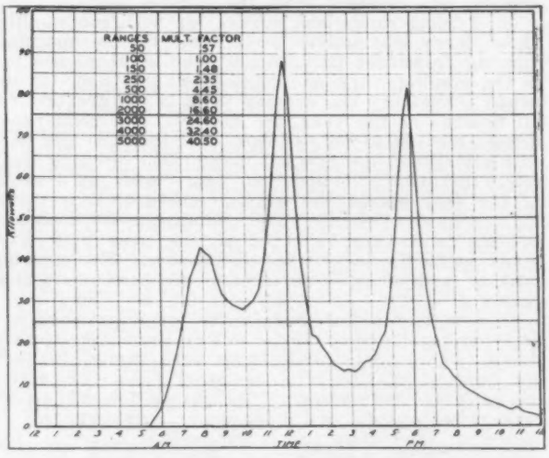


Fig. 8. Typical electric range load curve for a rural community for 100 ranges with mutiplication factors for groups of from 50 to 5,000 ranges.

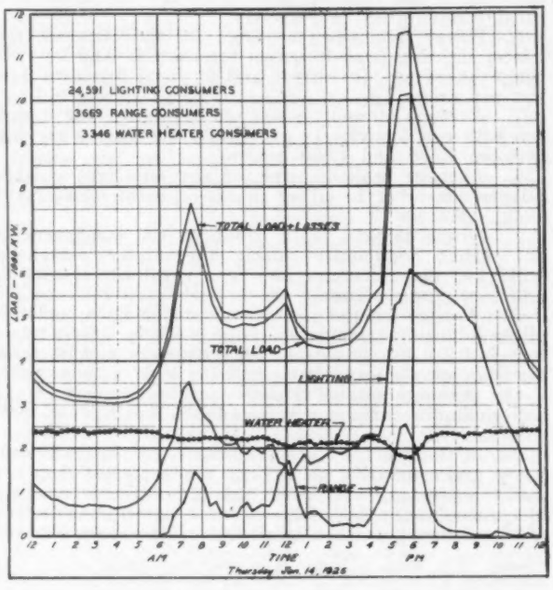


Fig. 9. Lighting feeder load curves for Spokane, Wash., for typical winter day showing relation of component parts and various peaks.

planned as a part of the new range load then its load curve also should be added. Since the demands as shown on the curves are at the consumers' premises, the distribution losses must be added. These losses will vary according to the distribution-system efficiency and each utility will have a value or percentage loss which it has determined for itself. With the new feeder-load curve then available it will be possible to arrive at the additional investment required in distribution facilities.

TABLE I.—Average maximum demand of an electric range.

Place	Number of ranges tested	Average maximum demand
Spokane	45	3.67 kw.
Payette	63	3.56 "
	108	3.61 kw.

TABLE II.—Average maximum demand of lights and appliances.

Place	No. of lights and appliance consumers tested	Average max. peak	Average max. evening peak
Spokane	30	0.673 kw.	0.523 kw.

The total number of ranges and water heaters supplied by all the feeders is of course known and it is necessary again to refer to the typical range and water-heater load curves to determine the typical load curve at the substation for all the ranges. The distribution losses are added and this curve added to the substation load curve to give the total substation capacity required. The difference between the new capacity and that already available determines the additional investment in substation facilities. The same procedure is followed on through to the generating station and a figure is derived at last representing the additional investment in the entire plant to serve the new range load.

The total investment in the property to serve industrial, commercial, residential and range load then is known and the problem becomes one of allocating to each service its part of the investment and share in operating and maintenance expenses. The proper allocation is an open question and may vary considerably for each electric service company but with the costs finally proportioned to the satisfaction of those concerned a rate can be devised. If its value proves to be such that the public will avail itself of the new type of service there can be no question that the service should be rendered.

TABLE IV.—Connected load.

	Spokane		Payette	
Appliances	Number per Consumer	Connected Load per Consumer (Watts)	Number per Consumer	Connected Load per Consumer (Watts)
Range	1.000	7,140	1.0	5,744
Water Heater	1.000	814	0.693	967
Vacuum Cleaner	0.715	125	0.726	127
Washing Machine	0.605	121	0.680	132
Flat Iron	0.978	587	1.015	610
Percolator	0.314	126	0.435	173
Waffle Iron	0.270	162	0.380	228
Air Heater	0.234	140	0.346	208
Sewing Machine	0.138	13.8	0.240	24
Grill	0.022	13.2	0.167	100
Heating Pad	0.117	58.5	0.140	70
Toaster	0.474	237.0	0.413	206
Refrigerating Machine	0.022	4.4	..	..
Fan	0.037	3.7	0.346	34.6
Ironing Machine	0.051	76.5	..	..
Curling Iron	0.474	71	0.453	68.0
Lights	25.0	1,000.0	15.9	635
Total Watts	..	10,603.1	..	9,326.6
Watts without Range and Water Heater	..	2,740.0	..	2,615.6
Persons per family	3.44	..	3.62	..
Maids	0.16	..	0.027	..
Rooms per house	6.10	..	5.68	..

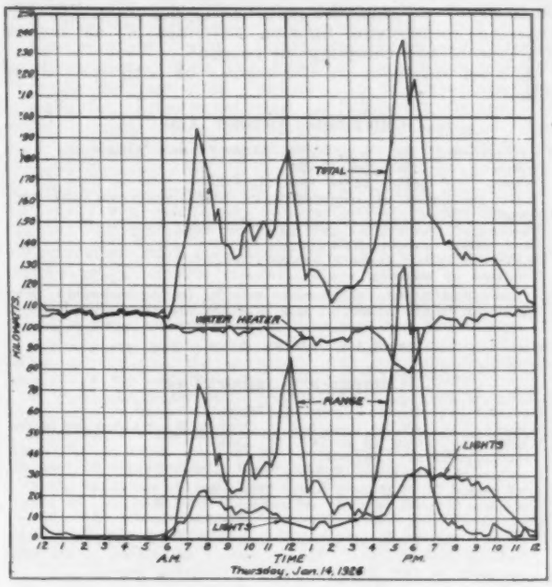


Fig. 10. Load curves for 150 range consumers, Spokane, Wash., for typical winter day.

TABLE III.—Load data (based on 150 consumers).

		Spokane					Payette				
		Per consumer			Per cent load factor	Per cent demand factor	Per consumer			Per cent load factor	Per cent demand factor
Equipment	Season	Connected load-kw.	Peak kw.	Kw-hr. per week			Connected load-kw.	Peak kw.	Kw-hr. per week		
Range	Spring	7.14	0.87	24.4	16.7	12.2	....	....	....	....	....
Range	Summer	7.14	0.88	23.7	16.0	12.3	5.744	0.83	29.5	21.2	14.5
Range	Fall	....	....	....	....	....	5.744	0.87	33.2	22.7	15.1
Range	Winter	7.14	0.84	25.6	17.5	12.2	5.744	0.87	30.7	21.0	15.1
Light and Appliances	Spring	2.740	0.200	8.46	25.2	7.3	....	....	....	....	....
Light and Appliances	Summer	....	....	....	....	....	2.616	0.100	2.99	17.8	3.83
Light and Appliances	Winter	2.740	0.246	12.85	31.1	8.95	2.616	0.172	7.38	25.6	6.6
Range, Lights and Appliances	Winter	9.88	1.06	37.8	21.2	10.7	8.36	1.008	38.2	22.6	12.1
Water Heater	Summer	0.814	0.761	112.5	88.0	93.3	0.967	0.750	76.0	60.3	77.6

Merchandising Committee Report*

The merchandising committee has chosen for the main subject of its report the sale of commercial lighting service by campaign methods. This report includes two complete campaigns for the promotion of commercial lighting operated by different companies in territories of different character. Both campaigns were successful although the methods used and results obtained vary to a considerable extent.

Campaign No. 1 was operated by The Washington Water Power Company in Spokane, a city of 129,000 inhabitants. The illuminating engineer of that company was directly in charge of the activity and every effort was made to make the campaign self-supporting.

Campaign No. 2 was operated by the Pacific Power & Light Company in all of its branches which take in 15 towns varying in population from 1,500 to 2,500. The campaign was conducted by the merchandising department of that company with the object of increasing commercial lighting revenues at as low a net cost to the company as possible.

A brief summary of the results of both campaigns follows:

Campaign Number One

Operated by: The Washington Water Power Company.
Where: Spokane, Wash.
When: Sept. 21 to Oct. 17, 1925.
Total population of community in which campaign was conducted: 129,000.
Number of commercial lighting units sold: 589.
Load added to company's lines: 85 kw.
Estimated annual revenue secured: $3,200.
Net cost of securing above revenue: $253.81.

(Note: All items of expense incurred in the campaign were included in the above. These expenses are shown in the cost summary of that campaign in the following pages.)

Cost per kilowatt of load added: $2.98.

Campaign Number Two

Operated by: Pacific Power & Light Company.
Where: At its branches in Oregon, Washington and Idaho.
When: Oct. 13 to Dec. 16, 1925.
Total population: 105,000.
Number of commercial lighting units sold: 1,374.
Load added to company's lines: 235.61 kw.
Estimated annual revenue secured: $11,280.50.
Cost of securing above revenue: $3,369.54.

(Note: All items of expense incurred in the campaign were included in the above. These expenses are shown in the cost summary of that campaign in the following pages.)

Cost per kilowatt of load added: $14.27.

Commercial departments at times have been criticized for estimating probable increases in annual revenue at too high a figure. In order to determine exactly what were the results of this campaign activity an analysis was made of 65 representative accounts where commercial lighting units had been sold. This analysis compares the kw-hr. consumption and bills rendered to 65 customers for the months of January, February and March, 1925, with the months of January, February and March, 1926.

The following are the results of the comparison taken from the company ledgers:

Total kw-hr. billed for first three months of 1925: 55,005.
Total kw-hr. billed for same three months of 1926: 71,004.
Increase in kw-hr. consumption: 15,999.
Percentage of increase: 29.

Total kw. increase in connected load due to campaign for above customers: 31,350.

Cost of obtaining this business, based upon average campaign cost: $447.36.

Based on an average kw-hr. cost of 5 cents, the actual increase in kw-hr. sales to these customers over a period of three months was nearly twice as much as it cost to secure the increased business.

Carrying the calculations further, if it is considered that the increased revenue for the first three months was entirely the result of the increased load and equal to one-fourth of the yearly revenue, it would appear that the new business secured is worth better than $100 per kw-yr. to the company. Undoubtedly this is a higher figure than is received for this class of service and may be explained by the fact that there is a tendency to use all of the connected load now more than before the new load was added. Regardless of the cause of the increase in kw-hr. consumption, and corresponding revenue to the company, records show that the increases in the short period of three months more than justified the cost of obtaining this new business.

Campaign No. 1

Abstract Report of Commercial Lighting Campaign of Washington Water Power Company: Selling commercial lighting fixtures on a campaign basis is something new to the central stations of the Northwest. The campaign conducted by The Washington Water Power Company from Sept. 21 to Oct. 17 (four weeks) is believed to be the first one attempted in this part of the United States.

The campaign was a success judging from the results and compared to anticipated benefits. A canvass of the 2,200 commercial establishments in Spokane netted a sale of 589 lighting units after all cancellations were deducted. Lighting equipment was sold to 208 customers in nearly every line of business. However, the grocer was the best prospect, accounting for the sale of 109 units to 40 grocers. The central station is interested primarily in the load-building possibilities of different appliances. From this standpoint the commercial lighting unit compares favorably with the much larger and more costly appliances. The actual connected load of all lighting equipment sold and installed was 190 kw. or an average of 320 watts per fixture. The increased wattage over the old equipment was about 85 kw. which will produce an added revenue of at least $3,200 per year. This revenue of $40 per kw-yr. compares quite favorably with the electric range in dollars per kw. of demand, a point not ordinarily considered with a lighting load.

The cost of selling this merchandise was slightly more than the selling price due to the comparatively large amount spent for newspaper advertising. However, this expenditure has proved to be of great value in spreading general information about better lighting to merchants and their customers. A considerable number of requests for units and for advice received since the campaign by the illuminating engineer can be traced to this advertising.

The following cost summary is quite accurate but it was thought best to include an item of $50 to cover small expenses not regularly billed.

Cost Summary

Item	Cost	Cost Per Unit
1. Fixtures and installation of same	$4,536.39	$7.69
2. City inspection charge	102.50	0.18
3. Advertising, demonstration store displays, printing and photographs	1,555.92	2.64
4. Cancellations, cost of installation and removal	35.35	0.06
5. Commission for sale	883.50	1.50
6. Miscellaneous expense (estimated)	50.00	0.09
Total cost	**$7,163.56**	**$12.16**
Cash selling price	**6,909.75**	**11.73**
Difference	**$ 253.81**	**$ .43**

Item No. 1 includes, besides the cost of the merchandise, the electrician's charge for installation. This was slightly in excess of 75 cents per unit due to some extra work required before fixtures could be installed. No wiring was done by the company but $726.50 worth was installed by the electricians employed. This business amounted to $1.23 per unit and was more profitable than at first expected.

Item No. 2 is 50 cents per customer less three orders going outside the city.

Item No. 3 includes the following schedule of newspaper advertising:

Morning Paper .....531 in.
Evening Papers .....593 in.

Three demonstration stores were equipped with fixtures and a show window decorated and properly

* **V. H. Moon**, Pacific Power & Light Company, chairman. **California Oregon Power Company:** W. M. Shepard. **Northwestern Electric Company:** J. C. Plankinton. **Portland Electric Power Company:** J. L. White. **Puget Sound Power & Light Company:** R. W. Clark. **The Washington Water Power Company:** R. B. McElroy.

lighted during the campaign. The demonstration stores were a great help to the salesmen who could show a prospect just what his neighbor had done to improve lighting. Other demonstration stores were equipped with fixtures only. Two multigraphed letters were sent out, each with a return postcard, to a selected list of about 3,000 names. These letters were personally addressed by typewriter and signed in ink. Many answers were received to both letters and nearly every customer answering was sold. The expense of sending out these letters and post cards was only about 4 cents each.

Item No. 5 is based upon a straight commission of $1.50 per unit which was paid to seven of the salesmen, the other five being on a straight salary basis. These latter men carried on their regular duties as well as canvassed for this campaign. However, the commission would represent about 60 per cent of their salaries, which is liberal. Prizes were offered for a team selling their quota of 375 units. The highest commission was $96 for selling 64 units. The domestic appliance business was good during the month so that the earnings of each salesman on commission was much better than usual at that time of year.

Campaign No. 2 Plan of Operation

Organization.—Because of the fact that the campaign on store lighting was run concurrently with the annual washing machine sale in October and a campaign on ironing machines in November, the work was done by a separate organization.

The district manager was in charge of the store-lighting campaign in each locality. It was necessary for him to devote considerable of his time to its supervision.

A special crew of ten men trained in commercial lighting was secured for soliciting commercial lighting business. This crew was divided into five teams of two men each and the campaign was started simultaneously in five districts on the company's system. The lighting salesmen reported directly to the district manager and all reports of sales and solicitation received the district manager's O.K.

District managers were asked to:

1. Arrange for a model lighting installation to be made in one store prior to the opening of the campaign.

2. District managers placed our proposition before the representative contractor-dealers of their districts and secured their co-operation. The names of the dealers participating with us appeared with our own in the announcement advertisement which appeared at the beginning of the campaign.

3. District managers were asked to see that Survey Cards were properly filled out and information as to the customers' previous bills furnshed the salesmen.

4. District managers were asked to supervise the mailing, at the proper times, of the three broadsides which comprised our direct-mail advertising program.

5. District managers saw that daily reports on form furnished were submitted by the salesmen and copies forwarded promptly to the Portland office.

Quotas.—Each district was assigned a quota based upon the number of commercial lighting customers in that community:

Town	Units
Astoria	80
Dayton-Waitsburg	50
Goldendale	20
Hood River-White Salmon	60
Lewiston	100
Pasco-Kennewick	70
Pendleton	60
Pomeroy	25
Prosser	25
Seaside	25
Sunnyside	55
The Dalles	75
Toppenish	55
Walla Walla	125
Yakima	175
	1,000

Model Stores.—It was part of the plan that in each district where the commercial-lighting campaign was to be held a model store-lighting installation be completed prior to the opening of the campaign. In other words, the plan was to have a conspicuously located store lighted with our units to show prospective customers the results they might expect in their own establishments. In order to be sure of having such a store a very liberal proposition was made to some merchant in each town, the merchant to be selected by the district manager based upon the location of the store and the credit of the merchant. To one such merchant in each town the offer was to light his establishment as it should be lighted, without any responsibility on his part. If, after the installation had been made at company expense, the merchant wished to retain the installation, he could pay for it on the same basis as was offered the other merchants in the community. In this connection it was suggested that if possible the window lighting of the model store should be handled as well as the interior lighting. The company was prepared in this case to finance the wiring and equipment necessary for proper window lighting together with the fixtures for interior illumination. If it was possible to do the windows as well as the interior of the model store, full advantage was taken of the opportunity for colored lighting and spot lighting. District managers were cautioned that the model store installation would be an item of considerable expense to the company. The manager weighed very carefully all factors before making his selection of the merchant whose store was used as a model.

Co-operation with Contractor-Dealer.—It seemed at first glance that the proposed campaign on commercial lighting went further into the province that always had been considered as belonging to the contractor-dealer than any activity the company ever had sponsored. The company is not as a rule in the fixture business, but if the plan were to be a success it was of first importance that the hearty co-operation of every representative contractor-dealer in the community be gotten. It was the aim to obtain this co-operation and contractor-dealers were offered the following:

1. During the time of the commercial-lighting campaign contractor-dealers were furnished with stock of units featured in the campaign.

2. Contractor-dealers were allowed and in fact urged to sell these units during the campaign. The contractor-dealers were paid $3.50 for each unit sold and installed by them.

3. Contractor-dealers were paid $1 for each unit installed by them when it was sold by the company.

4. When a contractor-dealer made a sale to a customer on time the company financed the sale providing the opportunity to pass on the prospect's credit was available.

5. In addition to financing the time contracts for the purchase of lighting fixtures, the company offered the contractor-dealers who engaged in this campaign additional financial assistance. It was believed that there would be considerable wiring necessary in re-lighting stores. The company was prepared to finance such wiring contracts as were entered into as a result of re-lighting a store, and carried such a contract along with the contract for the lighting units. It was necessary to charge 10 per cent as a carrying charge in this case. This was charged to the consumer and the net amount of the wiring contract paid in cash to the dealer by the Pacific Power & Light Company. The selection of dealers to do additional wiring or installation of units was left to the district manager. In many instances the customer had a preference and his wishes were consulted.

6. Two salesmen, who were on the company payroll, were placed in the district and were glad to offer their services to any contractor-dealer co-operating in the sale of commercial lighting units. This help, which was freely given the contractor, in no way affected the amount of commission due him.

7. An announcement advertisement was used in the daily papers, approximately one-half page in size. The names of all contractor-dealers co-operating in the campaign appeared with that of the company under this large announcement advertisement.

All that was asked from the contractor was that the standards of illumination intensity outlined by the company be followed and that the company have an opportunity to pass on each installation sold and installed by the contractor. It was believed that the organized effort of all persons interested along one line would produce infinitely more business for all than single activities which might be conducted by individual contractors.

Survey Cards.—Each district was furnished a sufficient quantity of survey cards to cover their list of customers taking current under schedule B, or other metered commercial-lighting schedules. These survey cards were sent into the district prior to the opening of the campaign.

Cards were filled out and kept in account-number order so that they could be used for solicitation purposes. Attached to each survey card was a sheet giving a record of the prospect's commercial lighting account. This sheet showed monthly bills for the past year, the kw-hr. consumed per month and the

average cost per kw.-hr. of electricity used.

It was important that the information be furnished on the survey cards and that the analysis of the account be given to the salesman as the salesman probably would have to answer a good many statements which could not have been well handled if he had not had specific information with him.

It was not necessary that the entire group of commercial-lighting customers' accounts be analyzed at once. It was estimated that not more than 20 calls per day would be made during the campaign. If the accounts were analyzed by account numbers so that the information would be kept a few days in advance of the salesman's requirements, that was all that would be necessary. This would spread out the work over a longer period and relieve the burden somewhat.

Some sort of file was furnished to keep the survey cards and analysis sheet together. After cards and sheets were used for purposes of solicitation they were returned to the file with notations as to what had happened and were used for call-backs and future reference.

Direct-by Mail Advertising.—The direct-by-mail advertising employed during the campaign consisted of three pieces:

Broadside No. 1—This was a green broadside and on the inside of the first fold said: "Why not employ tongue-tied clerks—you could probably hire them for less."

Broadside No. 2.—This was a red broadside of the same size as No. 1. Inside of the first fold was the following: "More people buy by sight than are induced to buy by argument."

Broadside No. 3.—This was printed in yellow and black and on the outside the heading was: "A sensational offer to Business Men."

Broadsides were mailed in the rotation of their numbers given above and at intervals of two days. It was apparent that the first two broadsides were general in subject matter and simply conveyed the thought of profiting with light without offering any specific method of obtaining this profit. The third broadside gave our proposition as a means of realizing this additional profit. The last of the series of three broadsides reached the prospect not more than two days in advance of the salesman's call. It was apparent that the mailing of these broadsides must be so timed that this would be accomplished.

The three broadsides mentioned above were sent out in accordance with account numbers. The survey cards were used for guidance, a notation having been made on the back of the survey card when each broadside was mailed.

It was not advisable to mail broadsides too far in advance of the call of the saleman. It was estimated that approximately ten calls per day actually were made; therefore, only 10 broadsides per day were mailed out.

Report Forms.—Daily reports were required from the sales teams in the various districts. Report forms were furnished in sufficient quantity so that the original could be sent into the head office, one copy retained by the salesman and a third given to the district manager for his files. Salesmen were asked to give complete information on all reports turned in. The district managers were urged to see that this information was complete and that no sale be reported on these forms until it had been finally approved by the accounting department.

The report form had, on its reverse side, a space for listing the wiring contracts which had been entered into by our customers purchasing the lighting units. A complete record of such contracts as were to be financed by the company was kept and reported.

Prize Plan.—In order to stimulate sales, prizes were offered to the teams making the best showing. The following list of five prizes, totaling $250.00, was paid to the teams as outlined.

$50 to the team having to its credit the greatest number of sales by Oct. 17.

$50 to the team making the most sales between Oct. 17 and Oct. 31.

$50 to the team making the most sales from Oct. 31 to the end of the campaign.

$50 to the team making the highest percentage of sales in any single district on that district quota.

$50 to the team making the most sales during the entire campaign.

School for Lighting Salesmen.—A school for lighting salesmen engaged for the commercial-lighting activity was held in Portland during the week of Sept. 28-Oct. 3.

The operating company, the lamp manufacturer and the jobber each furnished one instructor who devoted his entire time to the school for commercial-lighting men for that week. Each salesman received a quantity of literature on the subject of illumination.

A ft.-candle meter also was available at the meeting and its method of use explained to the salesmen. While it probably would not be necessary to use a ft.-candle meter continuously it was thought advisable for all men engaged in selling the units to be familiar with its operation.

Final instructions were given the salesmen in regard to their work on such subjects as co-operation with contractor-dealers, re-calls, distribution of advertising materials, prices and reports.

Personal Cards.—Each salesman soliciting commercial-lighting business was furnished with business calling cards designating him as a representative of the company. The card bore on the face the slogan "Profit with light—pay with the profits."

Cost Analysis

Total units sold	1,374	$17,359.25
Commission to dealers	$1,487.50	
Installation by company	949.00	
Advertising	426.35	
Cost of lamps	732.00	
Salaries	3,622.42	
Expense accounts	2,486.35	
Miscellaneous expense	100.00	
Broadsides, etc.	347.33	
Postage, broadsides	240.00	
Glassware and hangers	9,837.84	
Total cost		$20,728.79
		—$ 3,369.54

Load Increases Secured Through Kitchen-Lighting Campaign

In order to secure an actual check on the effect of the kitchen-lighting campaign on residential kw-hr. consumption, an analysis was made of a hundred representative residential accounts for a period of one year prior to and one year after the installation of the kitchen-lighting units in the homes.

The following figures, obtained as outlined above, should be of interest to member companies:

Average yearly consumption of 100 representative residential accounts prior to the installation of the kitchen-lighting units	256 kw-hr.
Average yearly consumption of 100 representative residential accounts after the installation of the kitchen-lighting units	323 kw-hr.
Average yearly gain	67 kw-hr.
Average yearly revenue gained at 5 cents per kw-hr.	$3.35
Average monthly consumption prior to the installation of the kitchen-lighting units	21.4 kw-hr.
Average monthly consumption after the installation of the kitchen-lighting units	27 kw-hr.
Average monthly gain	5.6 kw-hr.
Total gain	26%

In selecting the accounts for the above analyses an attempt was made to cast out any accounts where the consumption was known to have been increased by other means. It is believed that the increases shown above can be attributed almost entirely to the installation of the Daylight kitchen unit.

Power Committee Report*

After careful consideration of the field of possible subjects to be investigated, the power committee felt that it could well direct its efforts toward reviewing the industrial heating and heavy duty bake-oven situation in the Northwest. The general idea, we believe, is that these committee reports should be made primarily for the purpose of helping the various member companies of our association to learn what "the other fellow" is doing and thereby improve their own methods.

Whether we realize it or not, all central stations are tied together in the public mind and the policies and rates operative in one city have their effect upon every other city in the district. Especially is this true since large syndicates are establishing or acquiring control of branch businesses in all our larger cities. Mergers in theatres, door factories, foundries, chain stores, bakeries, ice cream plants, office buildings, etc., always result in the local managers of the plants trying to force down the utilities' rates to equal the lowest rates granted in any city in the territory. It behooves us, therefore, to standardize our practices as much as local conditions will warrant and above all to eliminate poor rates and methods of business getting that react to the detriment of the central station industry as a whole.

The following typical examples are picked from the records of the utilities operating in the larger cities of this district and will serve as a basis for comparison and discussion:

Examples

1—Classification: Steel foundry.

Equipment installed: One 3-ton Electromelt furnace.
Connected load: One 3-phase 1,500-kva. transformer.
Maximum demand (measured): 1,600 kw.
Steel melted per month (average): 300 tons.
Energy used in 12 months: 1,627,200 kw-hr.
Average per month: 135,600 kw-hr.
Net rate earned: 1c per kw-hr.

2—Classification: Foundry.

Equipment installed: One-ton "Greene" furnace.
Connected load: Three 250-kva. transformers.
Maximum demand (measured): 785 kw.
Steel melted per month (average): 280 tons.
Energy used in 12 months: 1,476,000 kw-hr.
Average per month: 123,000 kw-hr.
Net rate earned: 0.98c per kw-hr.

Method of securing business: Business was obtained by helping the plant manager to get cost and operating data on the furnace. It took two years' steady effort to induce this firm to install the furnace and even then it would not do so except on six months' trial with option to reject furnace at no expense to itself if it proved unsatisfactory.

3—Classification: Bakery, doing a general baking business, including bread, rolls, cakes, pies, and pastry.

Connected load: Oven, lights and small power, 163 kw.
Maximum demand (measured): 158 kw.
Output: No data available.
Energy used in 12 months: Ovens, lights, power, 384,000 kw-hr.
Average per month: 32,000 kw-hr.
Net rate earned: 1.19c per kw-hr.

Method of securing business: Power company financed purchase of oven for the customer while the manufacturer guaranteed its performance. Terms allowed customer on $6,000 purchase price were: 20 per cent initial payment on delivery of oven and balance in eighteen equal monthly installments plus 6 per cent interest on deferred payments.

In comparison with Example (3), another large bakery using gas fired ovens consumed in 12 months, 315,100 kw-hr. for light, power and the charging of electric delivery trucks, on a demand of 97 kw., earning a net rate of 1.64c per kw-hr. This firm will not install electric ovens because of the high loss incident to junking its present ovens.

A word of explanation regarding the demand feature of the following four examples might be opportune at this time, inasmuch as confusion might result in making comparisons. The oven and light consumption is figured on a commercial light rate where the demand of the oven is disregarded and the light demand only used. This allows the customer the benefit of the lower steps in the rate schedule, so that most of the oven consumption comes at 3c, 2c and 1½c steps. The minimum charge, however, is based on the total connected load.

4—Classification: Bakery doing general baking business including bread, cakes, pies and pastry.

Connected load: Ovens, lights 390.61 kw. Power 37.02 kw.
Demand: Ovens and lights (assessed): 6.88 kw. Power, 24.75 kw.
Energy used in 12 months: Oven and lights 817,500 kw-hr. Power 80,484 kw-hr.
Average per month: Oven and lights 68,125 kw-hr. Power 6,707 kw-hr.
Net rate earned: Ovens and light, 1.075c. Power 2.127c.
Method of securing business: Power company financed purchase of ovens for customer while manufacturer guaranteed performance.
Discussion: Installation included two-deck ovens of 80 kw. capacity each and one full traveling oven 220-kw. capacity. A material saving in labor was effected. (Capacity of ouput, 4,000 loaves per hour.)

5—Classification: Baking cookies only.

Connected load: Oven 50 kw. Power and lights, 21.51 kw.
Demand: Oven (assessed): .2 kw. Power and light, 16.53 kw.
Energy used in 12 months: Oven 108,000 kw-hr. Power 8,733 kw-hr.
Average per month: Oven 9,000 kw-hr. Power 962 kw-hr.
Net rate earned: Oven 1.368c. Power 4.281c.
Method of securing business: Power company financed purchase of oven for customer, while manufacturer guaranteed performance. Help was given in designing the oven to meet customer's needs.
Discussion: Cost per dozen cookies baked, all classes, was 1/5c. Labor saving of oven pays for entire power bill. Continuous traveling electric oven was used, replacing rotary gas oven.

6—Classification: Bakery doing bread baking only.

Connected load: Oven and lights 51.17 kw. Power 5.34 kw.
Demand: Oven and lights (assessed): 1.17 kw. Power 4.80 kw.
Energy used in 12 months: Oven and lights 141,576 kw-hr. Power 9,108 kw-hr.
Average per month: Oven and lights 11,798 kw-hr. Power 759 kw-hr.
Net rate earned: Ovens and lights 1.318c. Power 3.615c.
Method of securing business: Power company financed purchase of oven for customer while manufacturer guaranteed performance.
Discussion: 50-kw., two-deck oven used. Satisfaction of customer has resulted in using oven more than anticipated because of performance, although there is an oil burning oven standing alongside the electric.

7—Classification: Retail bakery doing general baking business, including bread, cakes, pies and pastry in a suburban district.

Connected load: Ovens, light and power 12.46 kw.
Demand (assessed): Ovens, light and power .46 kw.
Energy used in 12 months: Ovens, lights and power 23,832 kw-hr.
Average per month: Ovens, light and power 1,986 kw-hr.
Net rate earned: Ovens, lights and power 2.515c.
Method of securing business: Co-operated with manufacturer in sale of oven.
Discussion: 12-kw., two-deck oven, the average size for the small retail baker in outlying districts.

8—Classification: Steel foundry.

Connected load: 500 kw. transformer.
Measured demand: 327 kw.
Steel melted per month (average): 95 tons.
Energy used in 12 months: 980,000 kw-hr.
Average per month: 81,700 kw-hr.
Net rate earned: 0.85c per kw-hr.

9—Classification: Steel foundry.

Connected load: 450-kva. transformer.
Measured demand: 400 kw.
Steel melted per month (average): 85 tons.
Energy used in 12 months: 750,000 kw-hr.
Average per month: 62,500 kw-hr.
Net rate earned: 0.88c per kw-hr.

10—Classification: Car shops.

Connected load: No data.
Measured demand: 1,040 kw.
Steel melted per month (average): 105 tons.
Energy used in 12 months: 1,470,000 kw-hr.
Average per month: 122,500 kw-hr.
Net rate earned: 0.83c per kw-hr.

11—Classification: Annealing furnace.

Connected load: 490 kw.
Measured demand: 273 kw.
Output, annealed parts per month: 76 tons.
Energy used in 12 months: 605,000 kw-hr.
Average per month: 50,400 kw-hr.
Net rate earned: 1c per kw-hr.
Working temperature: 475 to 500 deg. F.

12—Classification: Bakery, all classes of work.

Connected load: No data.
Measured demand: 76 kw.
Energy used in 12 months: 239,000 kw-hr.
Average per month: 20,000 kw-hr.
Net rate earned: 1.7c per kw-hr.
Output: 2,500 loaves bread, 60 cakes, and 40 gals. sweet goods per day.

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* **J. D. Scott,** Portland Electric Power Company, chairman. **R. W. Faville, G. B. Walker. The Washington Water Power Company: W. T. Ryan, E. E. Seofield. Puget Sound Power & Light Company: T. H. Gibbes.**

13—Classification: Bakery; bread and cakes.
Connected load: 45 kw.
Measured demand: 45 kw.
Energy used in 12 months: 193,000 kw-hr.
Average per month: 16,000 kw-hr.
Net rate earned: 1.5c per kw-hr.
Output: 1,400 loaves bread and 150 lb. cakes per day.

14—Classification: Bakery; bread, rolls and pastry.
Connected load: Oven and mixer motor 45 kw.
Maximum demand (metered): 30 kw.
Energy consumed in 12 months: 84,260 kw-hr.
Energy consumed average month: 7,022 kw-hr.
Average monthly bill: $117.10.
Average rate earned: 1.66c per kw-hr.
Output: Baker states that average monthly output would be equal to 57,200 1-lb. loaves.

15—Classification: Bakery; bakes large variety of cakes, rolls, cookies, bottom bread and miscellaneous pastries, using oven on average of 16 hours per day.
Connected load: Oven only 40 kw.
Maximum demand (tested): 44 kw.
Energy consumed in 12 months: 69,900 kw-hr.
Energy consumed average month: 5,825 kw-hr.
Average monthly bill: $105.57.
Average rate earned: 1.86c per kw-hr.
Output: Baker in charge states that the use of oven would be equal to the baking of about 90,000 lb. of breadstuff per month. Due to the variety of articles baked from day to day, he could not give a more accurate figure.

16—Classification: Bakery; bread and rolls and a small quantity of pastry.
Connected load: Oven only 40 kw.
Maximum demand (tested): 46 kw.
Energy consumed in 12 months: 66,260 kw-hr.
Energy consumed average month: 5,522 kw-hr.
Average monthly bill: $89.72.
Average rate earned: 1.63c per kw-hr.
Output: Average 39,000 lb. breadstuff per month.

17—Classification: Bakery; general baking, including bread, rolls, cakes and cookies.
Connected load: Oven and mixer motor 32 kw.
Maximum demand (metered): 30 kw.
Energy consumed in 12 months: 41,940 kw-hr.
Energy consumed average month: 3,495 kw-hr.
Average monthly bill: $99.67.
Average rate earned: 2.85c per kw-hr.
Output: Average monthly output as follows: 40,000 lb. bread, 5,200 doz. cookies, 4,000 doz. rolls and cakes.

Note: The majority of bakers called upon do not keep an accurate record of their daily output, but we have tried to arrive at a fair figure by discussing it with them and by comparison with other bakeries.

Conclusions

This committee is of the opinion that with the exception of steel furnace and bake oven loads, the industrial heating field in the Northwest has not even been scratched. In answer to the statement that industrial electric heating does not become available until diversified maufacturing develops on a larger scale than at present in our sparsely settled states, we direct attention to the fact that this statement is true only for large scale industrial heating. There are a multitude of small applications in small industries if we but look for them. These small applications bring a higher net revenue than the big furnace loads, which are invariably low rate stuff—1 cent per kw-hr. and under.

Pressing Machine Boilers

In connection with the development of small applications of electric heating along new lines, one company reports having done considerable work in connection with developing electric steam boilers for pressing machines.

The following tabulation gives a summary of one typical installation of this kind:

Classification: Electric steam boilers for clothes pressing.
Connected load: 1 phase, 4 to 6 kw.
Maximum demand (measured): 4 to 6 kw.
Suits pressed per month: 350 to 450.
Energy used per month: 1,000 to 1,500 kw-hr.
Net rate earned: 1.75c to 1.90c per kw-hr.

Three of these boilers have been in operation for about a year and have given very satisfactory service. These boilers are built either in vertical or horizontal types, the units being installed horizontally in either case. They are the hairpin type immersion unit. Fig. 1 shows examples of both the vertical and horizontal installation—one photograph showing the equipment before lagging. It will be noted that the equipment is made up entirely of standard pipe fittings. The boilers are equipped with a glass water gage, a safety pop-valve, and a steam gage and are thoroughly insulated with either 2 in. of 85 per cent magnesia or 2 in. sponge felt, with a protective canvas covering on the outside. They are built with a capacity of from three to four gallons of water with water level at the midpoint of the gage glass. They have a total capacity of approximately 6½ gal. of water, thus allowing from 2 to 3½ gal. for steam storage.

The particular company reporting handles the building of the boilers in its steam heating department, making the boilers out of either 8 in. or larger pipe.

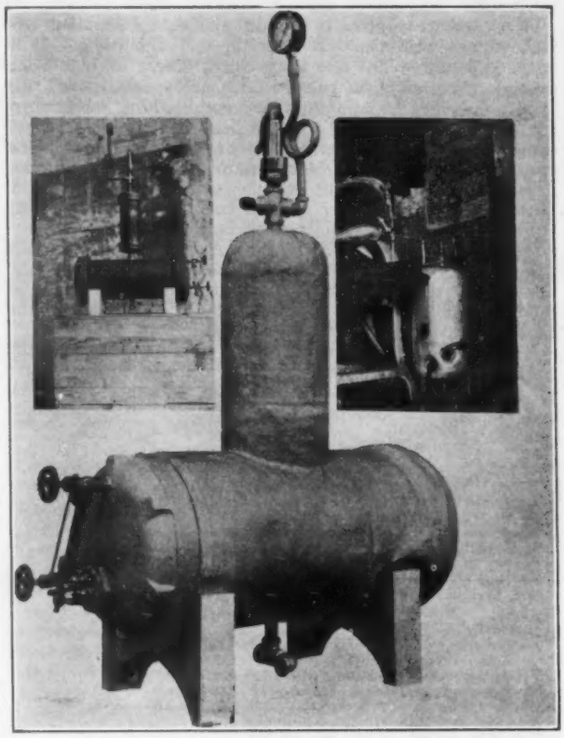

Fig. 1. Views of electric steam boilers for clothes-pressing service.

The horizontal boiler is sold at approximately $75 and the vertical boiler at $100. These boilers will operate Hoffman pressing machines very satisfactorily at a cost of from $15 to $25 per month for electric energy.

The particular company reporting the development of these boilers believes that on its system there will be a demand for approximately 100 installations of this type.

Financing Equipment

As to the question of securing business by financing the purchase of equipment for the prospective customer, the committee is not of one mind, the majority holding that central stations are not in the money lending business and that they are simply setting up the manufacturer's agent in business, and incurring unnecessary financial risks for themselves by so doing. As a method of pioneering a given field in virgin territory, however, it produces results. An outstanding example is that of the Northwestern Electric Company of Portland, which has taken on in excess of 700 kw. of new large baking load in the past year and a half by financing customer equipment. They contend they could not otherwise have added this load to their lines.

Pushed to its logical conclusion, there is no limit to which the financing of customer equipment might be carried, and most central stations are already carrying more deferred accounts than they desire without launching on a program that would materially add to the burden. The subject is one that will bear investigation from all of us.

Transportation Committee Report*

From such study as the committee has made of the electric truck situation, the field to which electric trucks may be applicable seems somewhat limited. Apparently the only field to which these trucks seem adapted, is the short-haul, frequent-stop delivery route. Since this is practically the only field in which horse-drawn vericles still are in use, and in which they could compete, practically all effort and publicity put out in connection with electric trucks seems to be directed toward the replacement of horse-drawn equipment. Where the trips are longer and stops less frequent the work is pretty generally handled by gas vehicles since electric trucks do not seem adapted to this class of work. Hence it will be seen that the field to which electric trucks are adapted in northwest territory is comparatively limited. Also the extent of horse-drawn equipment in that territory is considerably less than in eastern centers. These factors likely account for the small use of electric trucks and also account for the resistance to the further extension of their use.

A survey of the electric-truck situation has been made in northwest territory, and the following gives its present status:

Washington—In Seattle there has been a little more activity on the part of battery and electric-truck people during the past year to stimulate the use and operation of electric trucks. There are in use in Seattle six electric trucks, operated by a laundry, two bakeries and the central station.

In Spokane there has been no special activity, due largely to the fact that no electric truck salesmen are active. There are, however, in operation in Spokane ten electric trucks, seven operated by laundries, two by a bakery, and one by a transfer company.

Oregon—In Portland one truck agency is very active and now is taking steps to arrange for changing stations in several of the prominent down-town garages. This should prove a considerable impetus to the sale of this type of truck since the elimination of charging equipment on the part of a purchaser will materially reduce his investment.

A prominent dairy has just placed in operation two 2-ton electric trucks. Several dairies, bakeries, laundries, transfer companies, and ice cream companies are giving this matter considerable study at this time and will watch the operation of these two new trucks with considerable interest.

There are in operation in Portland, in addition to the above-mentioned trucks, 25 electric trucks, 13 operated by bakeries, 9 by the American Express Company, and 3 by department stores.

Outside of Portland, so far as could be learned, no electric trucks are in operation.

Idaho—No activity during the past year and no electric trucks reported operating.

Montana—Little activity during the year. In Missoula the central station is operating two electric trucks which are giving entire satisfaction. They are particularly impressed with their long life, small upkeep and dependability.

Utah—In Salt Lake City a survey now is being made of all short-haul, frequent-stop routes and especially of all deliveries by horse-drawn equipment, towards the end of handling some of this business by electric trucks. No trucks now are in operation in the state.

One of the main drawbacks to the introduction of electric trucks seems to be in servicing. Especially the provision of charging equipment and also in follow-up work after a sale is made to see that the trucks are used on service for which they are adapted and in which they will show a saving, thus preventing the user from becoming dissatisfied.

It seems to be the consensus of opinion that this work should be aggressively handled by the truck sales agency. The truck agency also should be prepared to finance the sale of this equipment at least to a certain extent.

It has been contended that the central station should be the pioneer user of electric trucks and should use them wherever possible. In this particular territory, where a company must make the greatest possible use of all its motive equipment, electric trucks cannot be purchased and put into use indiscriminately. However, it is suggested that each company make this a real problem and determine where electrics can be used to advantage in operations. If such company uses no electrics it builds up sales resistance in connection with other prospects.

From the work of your committee this year it would appear that greater progress is being made in Portland than in the balance of the territory. This is likely due to a more aggressive campaign on the part of truck agencies there, but also due to the fact that the central station in Portland has made a rather extended study of the electric-truck problem, has sent men to the various truck schools on the coast, and seems entirely sold on its possibilities at least for certain classes of work. In some other sections apparently little study or attention has been given this problem with the result that no one in the organization has a very definite idea of the possibilities of this particular class of load builder, or aggressively follows this line of endeavor.

It is believed that this field has not been developed in this territory, nearly to the extent to which it can be developed. One way in which it can be further extended is for each company to take a real interest in this situation and to assign this work definitely to some member of the sales organization who will make it his job to study thoroughly and constantly follow this problem.

There is one field which seems to hold possibilities and in connection with which little has been said. This is the use of small electric storage-battery trucks for inside work in industrial plants and for haulage in connection with railroad depot work. There are certain installations where such trucks can be used to very good advantage and it would seem, due to elimination of noise and gas fumes, would have little competition.

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* **R. H. Ashworth, Utah Power & Light Company, chairman. California Oregon Power Company: R. S. Daniels. Helena Light & Railway Company: A. T. Schultz. Idaho Power Company: J. B. McLain. Pacific Power & Light Company: R. J. Davidson. Portland Electric Power Company: J. D. Scott. Puget Sound Power & Light Company: R. W. Clark. The Washington Water Power Company: E. E. Scofield.**

Public Relations Section Reports

Executive Committee Report*

The personnel of the active committees functioning under the Public Relations Section were all selected at the beginning of the association year, which enabled such committees to formulate their programs and start to function without delay.

The first meeting of the executive committee was held in Portland, Ore., on Dec. 4, 1925, and was attended by the following members:

W. W. Briggs, Grays Harbor Railway & Light Company, Aberdeen, Wash. Z. E. Merrill, Mountain States Power Company, Albany, Ore. (representing C. M. Brewer.) W. J. Dennis, Northwestern Electric Company, Portland, Ore. P. M. Parry, Utah Power & Light Company, Salt Lake City, Utah. (Representing D. C. Green.) A. C. McMicken, Portland Electric Power Company, Portland, Ore. Geo. L. Myers, Pacific Power & Light Company, Portland, Ore. W. H. Ude, The Washington Water Power Company, Spokane, Wash.

The following committee chairmen and officers also were in attendance:

L. A. Lewis, president; W. F. Miller, secretary; Mrs. L. A. McArthur, chairman, women's committee; H. G. Winsor, chairman, industrial relations committee; Dwight Ware, chairman, customer-ownership committee, and J. B. Fisken, chairman, public speaking committee.

At the request of the chairman, President Lewis made a brief report covering his recent trip to Chicago where he attended a meeting of the Public Relations National Section.

The financial report, which was read by the chairman, revealed that $2,570.67 had been expended out of the Section's appropriation of $4,000, leaving a balance of $1,429.33.

Women's Committee

Chairman Mrs. L. A. McArthur of the women's committee made a very interesting report outlining the activities of her work, stating that she had been successful in organizing a total of fourteen groups of women in the various member companies of the association. Mrs. McArthur's committee held its initial meeting in Salt Lake City during the month of October. It proved to be a very successful meeting, and was followed with another meeting in Seattle in February.

Customer-Ownership Committee

Dwight Ware, chairman of the customer-ownership committee, reported that his committee has not as yet held a meeting during the current administrative year, but contemplated doing so in the near future. All were impressed with the importance of vigorously pursuing customer-ownership activities, and the committee charged with the responsibility of handling the work will do its part in making a satisfactory showing this year. The question of member companies exchanging their securities and good-will advertising was discussed, and it was the consensus of opinion of the meeting that this practice should be continued, with the understanding that member companies should send to Chairman Ware a sufficient number of copies of their various advertisements in order that he in turn might make proper distribution of them to the members of his committee.

Public Speaking Committee

J. B. Fisken of the public speaking committee outlined the program he had arranged for the members of his committee this year, and while he has not been very successful in securing copies of the various addresses made by officers and representatives of member companies, he was assured by those present of full co-operation in the future. There are indications that members of the committee will make as many talks this year as were made in previous years. Public speaking was thoroughly discussed by all present with the result that the chairman of the committee heading this activity received numerous valuable suggestions.

Industrial Relations Committee

H. G. Winsor, chairman of the industrial relations committee, reported that he had just completed the personnel of his committee, and that a meeting of the committee would be held in the near future. It is the plan of his committee to study the following program:

1. Employment.
2. Compensation..
3. Training and Education.
4. Thrift Plans.
5. Medical Attention and Health.

It was the consensus of opinion that the industrial relations committee should go into its proposed program very thoroughly and ascertain from member companies to what extent the program has already been adopted, and furnish them with such information as it is able to gather in connection with the various phases of the program in order that they might consider their adoption.

Educational Institutions

Section Chairman W. H. Ude reported on the activities of the committee on co-operation with educational institutions in the absence of Chairman A. J. Priest. He stated that at a recent meeting held with faculty members of the University of Idaho and the Washington State College, arrangements had been completed to provide speakers to discuss before student assemblies and classes of students the more important subjects relating to the light and power industry. When the program at these two institutions is under way the committee will also make an effort to make similar arrangements with other higher educational institutions located in other cities throughout the Northwest geographic division.

The subject of radio interference was briefly discussed, and according to members of the executive committee practically all of the larger member companies have employed both full time and part time radio experts to assist in eliminating radio interference. The importance of the light and power industry co-operating with radio fans and radio dealers in order that improved radio reception may be realized is fully appreciated, particularly from a public relations angle.

Second Meeting

The second meeting of the executive committee was held in Seattle, Wash., on Mar. 12, 1926.

Roll call of the committee revealed the following members present:

W. H. Ude, chairman, The Washington Water Power Company, Spokane, Wash. N. W. Brockett, Puget Sound Power & Light Company, Seattle, Wash. G. L. Myers, Pacific Power & Light Company, Portland, Ore. C. M. Brewer, Mountain States Power Company, Albany, Ore.

The following committee chairmen and officers also were in attendance:

R. B. King, vice-president for Idaho; L. A. McArthur, chairman, women's committee (representing Mrs. L. A. McArthur); H. G. Winsor, chairman, industrial relations committee; J. B. Fisken, chairman, public speaking committee, and Dwight Ware, chairman, customer-ownership committee.

Considerable time was given to the discussion of a proper program for the Public Relations Section at the

* W. H. Ude, The Washington Water Power Company, chairman. N. W. Brockett, Puget Sound Power & Light Company, vice-chairman. The California Oregon Power Company: P. B. McKee. Eastern Oregon Light & Power Company: J. P. Lottridge. Grays Harbor Railway, Light & Power Company: W. W. Briggs. Idaho Power Company: A. J. Priest. Mountain States Power Company: C. M. Brewer. Northwestern Electric Company: W. J. Dennis. Pacific Power & Light Company: G. L. Myers. Portland Electric Power Company: A. C. McMicken. Utah Power & Light Company: D. C. Green.

forthcoming convention of the Northwest Electric Light and Power Association, scheduled to take place in Spokane, June 14-17, 1926.

It was the consensus of opinion that a debate on "Service" be staged by Charles A. Stuart, assistant to the vice-president and general manager of the Northern States Power Company, Minneapolis, Minn., and Norwood W. Brockett, director of public relations, Puget Sound Power & Light Company, Seattle, Wash. The question to be decided is to ascertain if a public utility company can secure and hold good-will on the basis of courtesy and service only, or if other activities such as: good-will advertising, public speaking, etc., are essential. The chairman was requested to have President L. A. Lewis, extend to Mr. Stuart an invitation to attend our convention for the purpose of debating the affirmative side of the subject mentioned. Mr. Brockett is to work out all details in connection with this debate.

In addition to this proposed debate it was the consensus of opinion that the subject of the relation of electricity to agriculture be given an important part on the public relations program, and that Dr. E. O. Holland, president of the State College of Washington, be invited by President Lewis to make the principal address. It was also recommended that Dr. A. H. Upham, president of the University of Idaho, at Moscow, Idaho, and Dr. James T. Jardine, director of the Oregon Experimental Station, Corvallis, Ore., be invited to participate to the extent of making a fifteen or twenty minute address. It was also thought advisable to invite Dr. E. A. White, director of the national committee on the relation of electricity to agriculture, Chicago, Ill., to present a short report covering the accomplishment of his committee during the past year.

Inasmuch as that suggested program undoubtedly would take up most of the afternoon, it was the opinion of the executive committee of the Public Relations Section, that the women's committee ought to be given an entire afternoon for its program, and the chairman was requested to arrange such through President Lewis.

All concerned were agreed that it would be unwise to devote any time to the discussion of committee reports because all such reports would be available to members of the association in proceedings form.

L. A. McArthur favored the committee members with a very thorough outline of the municipal ownership measures which have been initiated in the state of Oregon.

The question of radio interference was also discussed at some length, and the importance of member companies co-operating with radio listeners for the purpose of eliminating interference was emphasized.

Rural Electrification

The state advisory committees covering, Idaho, Washington and Oregon, each are making satisfactory progress in connection with their studies on the relation of electricity to agriculture, and will render their reports at the forthcoming annual convention of the association taking place in Spokane, June 14-17, 1926.

Educational Institutions

Under the able leadership of Chairman A. J. Priest, the committee on co-operation with educational institutions has accomplished some very excellent results. It has secured closer co-operation between institutions located in the Northwest geographic division. A splendid foundation for future work has been laid by this committee, and it is hoped that future administrations of the association will continue to do similar work.

Committee on Customer-Ownership

Regardless of the fact that only one general meeting of the customer-ownership committee has been held during the current year, the work under the able leadership of Dwight Ware, chairman of the committee, has been carried on in an energetic and effective way. Member companies of the Northwest geographic division thoroughly appreciate the importance of vigorously prosecuting their customer-ownership program.

Committee on Public Speaking

Under the very able leadership of Chairman J. B. Fisken, the committee on public speaking accompished much good for the light and power industry during the current administrative year. While no meetings of the committee were held, the work was nevertheless vigorously prosecuted by correspondence. The report of this committee is interesting and instructive and should be carefully studied by every member of the association.

The second annual report of the women's committee of the Northwest geographic division will reveal the progress made by that committee under the able leadership of Mrs. L. A. McArthur, wife of the vice-president and general manager of the Pacific Power & Light Company, Portland, Ore., who very graciously accepted the important assignment of chairman. The splendid results that are being secured by the women of our industry throughout the Pacific Northwest are conspicuous, which this executive committee feels sure compares very favorably with similar work being done in other geographic divisions of the N.E.L.A. throughout the nation.

This branch of the association's work should be carried forward in the future in the same aggressive manner as that of the past year, and if so continued the results will be reflected in a very much better public understanding of the many problems concerning the light and power industry throughout the country.

Reports of Committees on Public Relations for Washington, Idaho, Oregon, Utah and Montana

The vice-presidents selected to look after the public relations work of the various states located in the Northwest geographic division have done a good work for the light and power industry, as their published reports in the proceedings of the forthcoming annual convention will reveal.

General Remarks

The executive committee of the Public Relations Section acknowledges with gratitude the co-operation and assistance rendered it by President Lewis A. Lewis and representatives of member companies who served so faithfully and well on its committees throughout the past year.

It is hoped and strongly recommended that the various activities of the Public Relations Section be carried forward aggressively the coming year.

Women's Committee Report*

The women's committee of the Northwest Electric Light and Power Association, although so new, is signifiant for the timeliness of its inauguration. The chairman has met with warm and intelligent interest and found a willingness to work on the part of the women. There has been also an invigorating desire to start this work off under the most favorable auspices on the part of company executives and officials.

There are a number of small Class "A" companies in the Northwest association which are represented through the larger companies controlling them. All except two of these larger companies have organized women's committees and of one of these the company has appointed a chairman. Most of the smaller Class

* Mrs. L. A. McArthur, Pacific Power & Light Company, chairman. Eastern Oregon Light & Power Company: Anna Gyllenberg. General Electric Company: Clara Redheffer. Grays Harbor Railway, Light & Power Company: Esther Miller. Idaho Power Company: Mrs. N. J. Johns. Molalla Electric Company: Mrs. E. G. Robinson. Mountain States Power Company: Stella Dorgan. Northwestern Electric Company: Mrs. A. W. Angell. Oregon Public Utility Information Bureau: Edna Comstock. Pacific Power & Light Company: Ellen McCurdy, Gertrude Humphreys. Portland Electric Power Company: Marguerite Butler. Puget Sound Power & Light Company: Nelle Duffey, Bertie Neil. Utah Power & Light Company: Mrs. A. E. Moyle. The Washington Water Power Company: Mary K. Walsh.

"A" companies have few women employees. As this work goes on it is hoped that succeeding chairmen will interest these companies through the wives of employees, who may thus form committees of their own.

There are five large supply companies in the association, of which the General Electric Company in Portland has a women's organization, these including the Pacific States Electric Company, and Fobes Supply Company, jobbing companies, and the Stubbs Electric Company, a retail company. It is understood that several of the committee's central station chairmen have included the supply companies of their territory in their work, but owing to recent circumstances the committee has been unable to obtain data on this matter in time for this report.

The unique work of this committee, and this is the only one in the United States to have undertaken it formally, lies in the inclusion of the wives and families of company employees, in many cases, as integral parts of the women's work. The chairman feels that there is a great future in this field. Sufficient attention has not been paid in the past to the voting power of the seemingly negligible women.

The recommendation of the chairman for the future direction of this work by the Public Relations Section is that the Section emphasize the intimate nature of the work, seeking development of friendly personal relations between the women's committee and the men of its companies, and the public with whom the women come in touch. Group contacts, scattering contacts, such as those represented by public speaking, for instance, are, in the chairman's opinion, of no particular value without personal friendliness and individual follow-up work. Some contact with the people spoken to seems essential on the part of the speaker herself.

In conclusion, the chairman cannot speak too highly of the men and women with whom this work has brought her in contact. They stand high in her regard. She leaves the women's committee at the expiration of her term with regret and warmest congratulations to her successor upon the inspiring opportunities awaiting her.

Co-operation with Educational Institutions Committee Report*

This committee held its first meeting in Pullman, Wash., Oct. 16, 1925. Deans, heads of departments and other members of the faculties of Washington State College and the University of Idaho met with the committee. After detailed discussion of the form which our co-operation should take, it was decided to arrange a series of talks upon public utility subjects to be delivered to students in both institutions by officials of N.E.L.A. member companies in the Pacific Northwest. Tentative listings of both speakers and their subjects were prepared and submitted to the faculty members interested.

L. A. McArthur, vice-president and general manager of the Pacific Power & Light Company, delivered the first of this series of talks Dec. 16-17. Mr. McArthur addressed large student groups both at the University of Idaho and at Washington State College on the subject, "General Economics of the Public Utility Business." His discussions of this important phase of the public utility problem were favorably received and our faculty friends reported cordial interest on the part of the undergraduates themselves.

The committee chairman was given the second place upon the program. He discussed certain phases of public utility regulation, both at Pullman and at Moscow, meeting a large group of Washington State College engineering and economic students on Mar. 11. He talked to the groups, one of students in business administration and the other of engineering students and prospective lawyers, at the University of Idaho the following day. Questions asked disclosed that the students have an intelligent grasp of the elements of public utility regulation.

Arrangements are being made for the delivery of addresses by M. W. Birkett, of The Washington Water Power Company, and by President L. A. Lewis, of the Northwest Electric Light and Power Association, at some time in the very near future. J. B. Fisken's talk on the "History of Electric Service" has also been asked for, both at Pullman and at Moscow, and will be delivered before the close of the present college year. There seems to be every likelihood that at least five addresses on public utility problems will be delivered at these two institutions by officials of our member companies before college commencement time.

The committee feels that relations with the University of Idaho and Washington State College could hardly be more cordial. Faculty members have been more than friendly and there has not been the slightest difficulty about the arranging of college programs so that addresses on public utility matters could be presented at convenient times. It is hoped that it may be possible to arrange a committee meeting at one of the Oregon schools later this spring for the purpose of bringing about the same happy understanding with the University of Oregon, Oregon Agricultural College and the University of Washington which has been arrived at in the case of Washington State College and the University of Idaho.

The chairman's own feeling is that the industry has nothing to fear from the incipient "parlor socialism" in any of our Northwest institutions of higher education. There seems to be genuine interest in hearing the utility story and, although it is certain that faculty members would not look with favor upon propaganda, so long as the speakers confine themselves (as of course they will) to statements of fact and to unbiased presentations of economic, legal and engineering theories, there is every reason to believe that our speakers will be warmly welcomed and that their message will reach the undergraduate body under decidedly favorable conditions.

* **A. J. Priest**, Idaho Power Company, chairman. **Journal of Electricity:** B. H. Snow. **Oregon Public Utility Information Bureau:** W. P. Strandborg. **Pacific Power & Light Company:** R. B. Bragg. **Puget Sound Power & Light Company:** L. B. Faulkner, R. W. Lindley. **Utah Power & Light Company:** R. H. Ashworth. **The Washington Water Power Company:** J. B. Fisken.

Customer-Ownership Committee Report*

One general meeting of the customer-ownership committee has been held during the current year. It was the consensus of opinion of the members of the committee that the sale of stock to the public and to employees has been a success and should be continued wherever possible. All members reported an improvement in their contact with, and a better feeling towards the company on the part of the public, as well as an improvement in the esprit de corps of the employees who have become stockholders.

Companies actually engaged in the sale of stock to their customers during the present year report a very healthy demand for their securities, and in most cases the demand exceeded that of last year.

While it is natural that the number of employees owning stock should fluctuate, an estimate showed that an average of 50 per cent of the employees of companies represented were stockholders, and one company reported as high as 75 per cent of its employees stockholders.

* **Dwight Ware**, Puget Sound Power & Light Company, chairman. **The Montana Power Company:** F. M. Kerr. **Mountain States Power Company:** F. E. McKenna. **Pacific Power & Light Company:** S. E. Skelley. **Portland Electric Power Company:** H. C. Schade. **The Washington Water Power Company:** B. H. Bishop.

Instances in which a company has temporarily stopped the sale of stock to its customers show a tendency for an increase in the average number of shares held by stockholders.

While some of the companies who previously sold stock in their localities are not active at present, this is not an indication that the companies have given up the customer-ownership idea, but merely that they are not in need of funds from this source, or that their financial structures were such as not to lend themselves easily to the customer-ownership program.

Indications are that 1926 will be an active year for the customer-ownership committee members of the Northwest Electric Light and Power Association.

No important suggestions or radical changes in the method of selling stock to the public have been made.

Public Speaking Committee Report*

During the past year the chairman, on account of the wide distribution of the members of this committee geographically, did not consider it either necessary or advisable to hold any meetings of the committee, and all the work done has been done by correspondence.

Throughout the year this committee, through the chairman, has endeavored to co-operate with the national public speaking committee of which W. S. Vivian was chairman.

On Nov. 12, 1925, a copy of an organization plan which had been submitted for approval to the executive committee, Public Relations National Section, by the national speaking committee, and which had been approved, was sent to each member of this committee. This plan contemplated the following organization:

A. A national committee on public speaking.
B. Geographic division committees in public speaking.
C. State committees on public speaking.
D. District committees on public speaking.

In transmitting this organization plan to the members of this committee the chairman stated:

"I have notified W. S. Vivian, chairman of the national public speaking committee, that our association has no district nor state organization. I do not think it advisable to attempt such organizations at the present time but think it would be preferable to wait until the present divisional committee has become more active. I would be glad to learn your ideas on this subject."

As no adverse criticism was received this retiring committee makes the recommendation that the next committee to be appointed give this organization plan some consideration.

In the same letter of transmittal the chairman stated: "Please let me have your opinion regarding the program generally."

A Worthwhile Criticism

One member of the committee criticised this program as follows:

"I believe that educational talks before high school pupils regarding the electric light and power industry, its methods of billing and the economics involved, would be very helpful, but I am strongly of the opinion that in any such talks regarding the industry the service rendered by it should be emphasized and this should be followed by some comparative statistics showing the smallness of the industry, when it is measured in dollars and cents. The gross receipts per annum of the moving picture theatres are in excess of three and one-half times the residential lighting bills and in excess of the total gross receipts for residential, commercial and street lighting, power, etc. If we compared the total power receipts and the residential lighting receipts with such classes of business as wholesale groceries, wholesale dry goods, gasoline and automobile sales, we would be able to show that the bigness of the electric light and power industry can only be measured by the service its renders, and that as a matter of fact, if we use the dollar mark as yardstick, we are only running a peanut stand.

"I will frankly admit that I am apparently out of line with the generally accepted ideas on publicity matters held by utility executives. It seems to me that the accepted program is that we should appear without invitation before every civic organization, or in fact every audience where we can get our foot in the door, and make a speech telling them how big the industry is. I firmly believe that the wave of municipal ownership agitation which seems to be again approaching has been prompted partly by this educational plan of telling people how big the industry is. The utility executives naturally, get the idea that the electric light and power industry is the biggest thing in the world, and the layman always uses the dollar mark as his yardstick. It is not surprising, therefore, that when the municipal ownership idea is suggested to him, he immediately deducts from the speeches regarding the electric light and power industry that if the city owned its light plant, the millions of money that it would make would pay all taxes.

"I personally believe that when we are requested to talk regarding our industry we should emphasize the small part of the family budget that is represented by the gross earnings of our business. The power business is purely competitive, and our comparisons should be made on the residential lighting bills."

This communication was submitted to the other members of the committee for their criticisms and was discussed at a meeting of the executive committee of the Public Relations Section. To some extent, though not entirely, the ideas above quoted were endorsed. This is a question which should be given serious consideration by the committee next year.

Early in the year the attention of the members of the committee was called to the speaker's hand book which had been issued by the national committee on public speaking, but very little use has been made of this publication.

Few copies of talks given during the year have been furnished the chairman, but all such talks have been duplicated and copies have been furnished to the members of the committee.

The following statement covers the talks reported by the different members of the committee as being given:

Summary of the Work

Lewis A. McArthur for the Pacific Power and Light Company's territory:

Speakers

Lewis A. McArthur	3
Geo. C. Sawyer	3
S. E. Skelley	15
H. H. Schoolfield	1
District managers	5
	27

Attendance

Audiences in Idaho	350
Audiences in Washington	2,150
Audiences in Oregon	1,400
Audiences not detailed	250
Total	4,150

Character of Audiences

Students.
Chamber of commerce.
Luncheon clubs.
Subjects not reported.

A. J. Priest for the Idaho Power Company's territory:

No talks have been given by anyone connected with this company. At present skeleton talks covering public utility problems generally, and their own operations specifically are being prepared which can be given before luncheon clubs and similar organizations.

Captain Norwood W. Brockett for the Puget Sound Power & Light Company territory:

* **J. B. Fisken**, The Washington Water Power Company, chairman. **Alaska Electric Light & Power Company:** W. S. Pullen. **The California Oregon Power Company:** P. B. McKee. **Eastern Oregon Light & Power Company:** A. A. Smith. **Helena Light & Railway Company:** A. T. Schultz. **Idaho Power Company:** A. J. Priest. **Pacific Power & Light Company:** L. A. McArthur. **Puget Sound Power & Light Company:** N. W. Brockett. **Utah Power & Light Company:** R. E. Bailey.

July 20, 1925. **Captain Brockett.** Before the Pacific Coast Advertising Clubs Association Convention. "Public Utility Good-Will Advertising." Attendance 25.

Aug. 21, 1925. Before the Pacific Coast Gas Association Convention. "Tell the People." Attendance 200.

Dec. 7, 1925. Before the midwinter meeting of the Chamber of Commerce of the United States. "Hydroelectric Development." Attendance 300.

June 3, 1925. **G. H. Peets.** Before the Broadway high school, Seattle. (Subject not given.) Attendance 65.

Dec. 18, 1925. Before a gathering at Oak Harbor. (Subject not given.) Attendance 300.

Mrs. Lemon. (Subjects not given.) Before the following audiences:

Oct. 5, 1926. Horticultural Society of Rainier Valaley, Seattle. Attendance 23.

Jan. 19, 1926. Seattle Business and Professional Club.

Various dates. Social clubs in Seattle (2). Improvement clubs, Seattle (5). Commercial clubs, Seattle (4). Community clubs, Seattle (5). Women's clubs, Seattle (73).

All of the above talks were given in the state of Washington. Captain Brockett also reports a large number of talks having been given by him and by others connected with him prior to the beginning of the association year, but these are not included in the above statement.

A. A. Smith for the Eastern Oregon Light & Power Company's territory:

Dates not given. **By A. A. Smith.**.. Before the Baker Chamber of Commerce. Attendance 35. Kiwanis Club at Baker. Attendance 50. Total all in Oregon 85. "Public Utility Problems in Connection with Proposed Water Power Bill."

A. T. Schultz for Montana:

Reports that no talks have been given by members of this company (The Helena Light & Railway Company) nor by any others at his request.

D. C. Green for the Utah Power & Light Company's territory:

Dates not given. **By E. L. Bourne.** The Kiwanis Club, Salt Lake City. "Super-power System of Utah Power & Light Company." Attendance 65.

Brigham City Commercial Club. "Cutler Development of Utah Power & Light Company." Attendance 200.

Intermountain Co-operative League: "Advertising for the Contractor-Dealer." Attendance 40.

Utah Society of Engineers, Salt Lake. "Engineering Advertising." Attendance 12.

Kiwanis Club, Salt Lake. "Street Cars, Motor Cars and Traffic." Attendance 60.

Contractor-Dealers' Association. "Selling Lighting and Wiring." Attendance 30.

Utah Power & Light Company employees, Salt Lake. "Selling Yourself and Your Company." Attendance 150.

Better Business Bureau, Salt Lake. "Truth in Advertising and Integrity in Selling." Attendance 30.

Kiwanis Club, Park City, Utah. "Super-Power System of Utah Power & Light Company." Attendance 30.

Advertising Club. "Selling Service." Attendance 52.

Dates not given. **P. M. Parry.** Municipal League, Mt. Pleasant, Utah. "Rate Making for Electric Service." Attendance 200.

Brigham City, Utah, Commercial Club. "The Electrical Industry." Attendance 200.

D. C. Green. "Electric Night" by radio, station KSL, Salt Lake City. "The Generation and Distribution of Power."

All of the above talks were given in Utah.

Paul B. McKee for the California Oregon Power Company's territory:

No report has been submitted by Mr. McKee but the following talks have been given in the district:

Dec. 1, 1925. **John B. Fisken.** Before the California Oregon Power Company Forum at Medford, Ore. "Accident Prevention and Resuscitation and Presentation of an Insull Medal." Attendance 150.

Dec. 2, 1925. Before employees' organization of Mountain States Power Company, at Albany, Ore. "Accident Prevention and Resuscitation." Attendance 80.

Dec. 3, 1925. Before the engineering faculty and students Oregon Agricultural College, Corvallis, Ore. "Accident Prevention and Resuscitation." Attendance 500.

All of the above talks were given in Oregon.

The only talk given in the territory of The Washington Water Power Company was given by Lewis A. Lewis, president of this association, on Sept. 8, 1925, before the Spokane teachers' institute at Spokane, Wash. His subject was "Your Electric Service Company" and the attendance was 200.

With one exception all the talks have been given by employees of member companies and without expense to the association. The one exception was the case of Mrs. Lemon who gave ninety-one talks to various organizations in Seattle.

This committee would urge that during the next year the member companies give some attention to the training of their employees in public speaking and avail themselves of every opportunity to tell the story of the electrical industry to the public.

State Vice-Presidents' Reports

Idaho*

Educational work, primarily among employees, has proceeded along the plans laid out in previous years, and pleasant relations, both among employees and with the public, have been maintained on an even balance, accomplished mainly by individual contact and fostered by assembly meetings from time to time, as well as by occasional distribution of timely topics in print and the progress has been marked by an almost complete absence of friction.

Employee relations are in sound condition, and a spirit of friendliness obtains, with wider feeling of mutual confidence.

Operating properties have been kept at a high standard of utility and appearance, and grounds surrounding the properties are maintained in cleanly and sightly condition. Visitors are made welcome to the grounds and, under escort, into the buildings. Various school classes have been visitors to their nearby electric stations in pursuit of their studies. Luncheon clubs, also, have been entertained in their visits to the stations.

Addresses and talks have been made by company executives and officials, from time to time, to various organizations, both business and social, and to institutions such as the Y.M.C.A. Members of the industry have continued to participate in public activities, through the fields of charity and uplift, ranging from the practicalities of material betterment to the higher ideals of mental improvement.

A women's public utility information committee has been organized and is functioning, but is not yet under good headway. Monthly meetings are held and the organization has been so perfected as to be quite ready to proceed further in its field. By the time another year rolls around it will have broadened its working field and widened its activities so that its accomplishments will have been marked.

Relations with the newspaper press continue along the lines of better understanding and present no features of remark.

The aim has been to establish good relations, more through the individual members of the industry in their associations with members of the public, rather than to carry on educational work "en masse." It has been the aim, also, to so order the ways and methods of doing business that the actions and deeds themselves will speak more loudly than words, and to accompany the actions, when and where feasible, with such verbal explanations as will tend to make the reasons open to common understanding.

Information to the employee of practical experience, of the whys and wherefores of this, that and the other subject, and the contact of the employee with members of the public, should be productive of a more effective means of education, at least among the directly interested members of the public, who use the service. And this has been our primary aim—to instruct and inform the employee so that he or she, in turn, can inform and advise the members of the public with whom contact is made. Applying as this does to the entire cross-section of the public, through the various classes of commerce, trade and profession

* Report of **R. B. King**, Idaho Power Company, vice-president for Idaho.

and applying continuously, together with addresses and talks continually being made by executives and officials to assemblies of many kinds, the results manifest have been quite gratifying.

Oregon*

The electrical power industry of Oregon seems certain to be confronted with the necessity for a campaign this year in opposition to proposed legislation for the production and distribution of electrical power by the state. Three initiative petitions have been filed with the secretary of state, two proposing amendments to the constitution and one proposing a bill. All initiative petitions must be filed not less than four months preceding the election at which they are to be voted upon, which would be in July, as the election is to take place in November. One of the proposed amendments has been filed by the Housewives' Council of Portland, and one by the Oregon State Grange and the bill is proposed by the Oregon State Grange, the Public Ownership League of Oregon and the Hydro-Electric League of Oregon.

"Housewives" Amendment

The outstanding provisions of the amendment proposed by the Housewives' Council provides for "The Oregon Water and Power Board," the original personnel of which is provided for therein for specified terms, upon the termination of which each member is to be elected by popular vote for a term of six years. The board is vested with power to construct or acquire by purchase or condemnation property needed for the development and distribution of electrical power, to acquire or construct distribution systems for political subdivisions and to acquire any property or the joint use of it by condemnation.

The credit of the state may be pledged to the extent of five per cent of the assessed valuation. Bonds may be issued and sold to provide payments for principal and interest upon outstanding bonds whenever revenues are insufficient therefor, or moneys may be temporarily advanced from the general fund whenever moneys applicable to the payment of principal and interest, when due, are insufficient and such sums are to be collected each year in addition to other revenues required by the state. Such moneys are to be returned to the general fund whenever revenues of the board become available. The board is to fix rates for service which are to be sufficient to amortize the investment within 50 years and, in the case of the construction or acquisition of distribution systems for political subdivisions, rates must be fixed which in the board's judgment will repay the state for expenditures and interest within thirty years.

The proposed amendment filed by the Oregon State Grange enables the State to develop and distribute electrical power and to pledge its credit for such purpose.

The "Water Power" Bill

The principal provisions of the proposed bill filed jointly by the Oregon State Grange, the Public Ownership League of Oregon and the Hydro-Electric League of Oregon are as follows:

A water and power board is created to consist of five members, the state engineer to be ex-officio a member and the other four members to be appointed by the governor and the terms of office to be four years. The board's powers are similar to those provided for in the proposed amendment of the Housewives' Council and other provisions are similar with the following exceptions:

The members of the board are to be salaried officials and are to perform all of the duties performed by the state water superintendent and the state water board, previous to the transfer of such duties to the state engineer in control of the waters of the state and the determination of rights to their use. The credit of the state may be pledged to the extent of four per cent of the assessed valuation. The board is authorized to issue "interest bearing hydroelectric utility certificates" against any property constructed or acquired, which certificates may be paid solely from the revenues in the operation or sale of such property. The board is to fix such rates as may be necessary to amortize the investment within thirty years.

All property owned or controlled by the state under the provisions of the proposed bill is to be taxed like other utility property. Provision for the sale of bonds and the appropriation of moneys from the general fund to make up deficiencies in revenue for the payment of principal and interest when due upon bonds outstanding are not a part of this proposed bill.

The amendment to the constitution proposed by the Oregon State Grange merely empowers the state to enact legislation so that it may produce and distribute electrical energy. Therefore, the proposed bill is to provide legislation, under authority of the proposed amendment to the constitution. The proposed bill would have only the effect of a legislative enactment and consequently is subject to amendment or repeal by the legislature or by the people under the initiative.

An organization to maintain an aggressive educational campaign against the adoption of the legislation proposed at the present time or any legislation which may be subsequently proposed is taking definite form at the time of the writing of this report.

Pole Line Permits

The committee had brought to its attention early in the association year the need of a standard form of permit for the location of pole lines along state highways. The committee, at a meeting in consideration of this subject, finally suggested to the State Highway Commission the advisability of a special committee, representative of the Highway Commission, the Public Service Commission, the telephone and telegraph utilities and the electrical power utilities, to make a study of the situation and submit recommendations to the Highway Commission, which suggestion was approved. A satisfactory meeting with representatives of the Highway Commission was held with the result that a standard form of application and permit was accepted. However, one point which may be productive source of trouble has not been settled. This is a provision for the designation of the location of poles and fixtures. The commission has designated a location 29 ft. from the center of the highway, which results in an overhang of crossarms on private property.

From the foregoing it will be observed that the committee has confined its activities to matters of legislation and relations with governmental administrative bodies, not having been active in other matters of public relations because specific committees of the Public Relations Section have been assigned to specific endeavors in the development and maintenance of satisfactory public relations.

* Report of G. L. Myers, Pacific Power & Light Company, vice-president for Oregon.

Utah*

Perhaps it is known that the Utah Power & Light Company is in a rather peculiar situation in respect to matters of this kind, since it serves most of the state of Utah. There are two or three independent companies in the state, but these are very small and serve unimportant and sparsely settled communities, and are consequently without funds for work of this kind. Under these conditions it would be evident to everybody in the state that so far as the light and power industry is concerned a committee on public utility information would actually be a committee of the Utah Power & Light Company, and any information put out by such a committee would be merely regarded as propaganda.

Consequently we have felt it desirable to do whatever publicity work has been done along this line frankly for and over the name of the Utah Power & Light Company. This is being done in the way of display advertising in urban and rural newspapers, local magazines and yearbooks or special publications of schools, civic societies, business associations, lodges or other aggregations of the public which it is believed desirable to reach with institutional messages to cultivate good will. Outdoor displays have also been used and frequent use is made of printed matter

* Report of D. C. Green, Utah Power & Light Company, vice-president for Utah.

inserted in customers' monthly bills. That the public desires to be informed in regard to public utility problems and policies would seem to be indicated by the frequent requests which come to us from clubs and other organizations for members of our organization to appear before them and address them.

Rocky Mountain Electrical Co-operative League

Aside from the publicity work conducted by the Utah Power & Light Company, there is also some good work of this kind being done by the Rocky Mountain Electrical Co-operative League, which is an organization supported by the various branches of the electrical industry in and about Salt Lake City, such as manufacturers, jobbers, contractor-dealers, and the Utah Power & Light Company. The present activities of this league, however, are limited to Salt Lake City and do not in any way cover the state of Utah.

The Utah Power & Light Company publishes a house organ which is distributed to its employees, in which it is endeavored to stress the importance of cultivating the good will of the public.

Frequent meetings of employees are held in the various divisions of the territory, wherein interesting discussions of company problems take place. In all of these meetings the subject of relationship with the public is emphasized. Relations with the public are on the whole satisfactory, and we have every reason to believe that this favorable condition will continue.

Washington*

The duty of investigating proposed legislation effecting the industry is also imposed upon this section.

At the recent special session of the legislature, many bills were introduced seriously affecting our business.

Roughly, they can be divided into two classes:

(1) Those which were introduced for the deliberate purpose of harassing and crippling the industry, and (2) those introduced in good faith, the authors of which have not made sufficient investigation of the problems involved to fully realize their effect.

The first class of legislation gave very little trouble. The average member of the legislature is sincere and honest in his desire to secure legislation which will benefit any legitimate business and when the malice behind the particular measure can be shown, he almost invariably resents the attempted use of legislative power to accomplish a malicious object.

The second class of legislation requires more work, in that it is necessary to convince the members of the legislature that such measures will not only cripple the industry but will be an actual detriment to the people of the state.

This can only be done by explaining these measures to the legislative committees to which they have been referred, and by also explaining them to the different members of the legislature. The committees are generally limited to six or eight members, while there are ninety-seven members in the House and forty-four in the Senate, each of whom will vote upon the measure.

In every case, we were invited to appear before the committee to explain just what the effect of these measures would be and our representatives were treated with uniform courtesy and consideration. We also found that the average member of the legislature was glad to have us talk to him on such measures, as he was seeking information which would enable him to vote intelligently.

The most serious measure was the Jacobs bill which followed the general principles of the Bone bill and permitted cities to sell electric energy outside their city limits. Its author, Mr. Jacobs, had written all the members of the legislature, before the session convened, that this was a "compromise bill," leaving the inference that the industry had acceded to the compromise. Through this means he obtained the pledges of many members who did not know that the measure was in reality the Bone bill, which had been repudiated by the people. Open meetings were held by the House committee to which this measure was referred and all but two members of this committee reported adversely upon the measure.

The majority of the members of the legislature were also convinced that this bill was not for the best interests of the people of the state, and it failed its passage.

An enumeration of all the measures which were introduced affecting the industry would be tedious, but the section is pleased to report that the members of the legislature refused to pass any measures aimed to cripple the industry or to prevent its legitimate expansion throughout the state.

* Report of **N. W. Brockett**, Puget Sound Power & Light Company, vice-president for Washington.

Technical Section Reports

Executive Committee Report*

Five meetings of this committee have been held during the past year. One of these was a luncheon meeting held at the time of the third general meeting of the Technical Section at Seattle, and one was an adjournment of this meeting. The remaining three meetings were as follows:

Portland, Sept. 4, 1925.
Seattle, Nov. 3-4, 1925.
Spokane, Jan. 6-7, 1926.

Average attendance at all five meetings was 74 per cent. Five members of the committee attended all five meetings, four attended four meetings, three attended two meetings and one attended one meeting. Everything considered, this can be termed a very good record, establishing the importance of and the interest displayed in the work of this committee.

Committees

The following committees were appointed and the chairmen requested to study as far as possible matters of particular interest to the industry in the Northwest:

Accident Prevention, John B. Fisken, chairman.
Electrical Apparatus, D. W. Proebstel, chairman.
Inductive Co-ordination, G. E. Quinan, chairman.
Hydraulic Power, O. L. LeFever, chairman.
Meters, R. E. Thatcher, chairman.
Overhead Systems, J. B. Brokaw, chairman.
Co-operation with Regulatory Bodies, H. J. Flagg, chairman.
Prime Movers. C. C. Simeral, chairman.
Underground Systems, E. F. Pearson, chairman.

The work of these committees is covered by separate reports submitted herewith.

National Group Meetings

The association was represented at both group meetings of the Technical National Section as follows:

Detroit group meetings, Oct. 6-9, 1925, Z. E. Merrill, O. L. LeFever and M. T. Crawford.

Kansas City group meetings, Feb. 9-12, 1926, John B. Fisken, R. R. Robley and E. F. Pearson.

* **Z. E. Merrill**, Mountain States Power Company, chairman. **Eastern Oregon Light & Power Company:** J. B. Brokaw. **Grays Harbor Railway, Light & Power Company:** H. J. Flagg. **Idaho Power Company:** F. J. Ranklin. **Northwestern Electric Company:** O. L. LeFever, E. F. Pearson. **Pacific Power & Light Company:** H. H. Schoolfield. **Portland Electric Power Company:** D. W. Proebstel, R. R. Robley, C. C. Simeral. **Puget Sound Power & Light Company:** G. E. Quinan, R. E. Thatcher. **The Washington Water Power Company:** J. B. Fisken.

The association also was represented at the joint use conference called by William Kelly, director of engineering, N.E.L.A., at headquarters in New York City, Sept. 29-30, 1925, by Z. E. Merrill, O. L. LeFever and M. T. Crawford. This conference, attended by 35 engineers from all parts of the country, was called for the purpose of defining the power industry's position as regards joint use of poles. It resulted in the drawing up of a set of principles and practices applicable for joint use. These were taken by the N.E.L.A. representatives on the joint committee as defining the industry's position in the matter and later were adopted to a great extent by the joint committee in Principles and Practices for the Joint Use of Wood Poles by Supply and Communication Companies. The adoption of these principles and practices by the joint committee composed of representatives of both power and communication companies has been a long step toward the settlement of a very vexatious subject. The association representatives justly are entitled to a share of the credit.

The usual amount of time and effort has been expended by all committees in co-operating with the National Section.

Annual General Meeting

The culmination of most of the work of the section for the year was the third general meeting held at the Olympic Hotel, Seattle, March 11-12, 1926. Each committee contributed a portion of the program and indeed it would be a difficult task for one to decide which portion was the most interesting or most important. The registered attendance was 151, exceeding that of any previous year.

The presence of Col. William Kelly from headquarters was an inspiration to those in attendance and did much to bring the Northwest Section and the National Section into closer relation and a better understanding of their respective problems.

Perhaps the outstanding feature of the meeting was the address of Franklin T. Griffith on Relation of Employees to the Public. This address was of a high order and attracted a number of member-company executives to the meeting. These, we believe, were favorably impressed with the work being done by the section as evidenced by the attendance and general interest.

In connection with the general meeting it is desired to direct attention to a resolution passed by this committee and published in the Proceedings of the third general meeting of the Technical Section. In this resolution the committee goes on record as absolutely opposed to any entertainment features in connection with general meetings that will interfere with or detract from the business of the meeting.

Insulator Tests

A portion of the insulator tests under way at O.A.C. laboratory have been completed, but the remainder will not be finished until the laboratory is able to secure additional equipment. The importance of completing this work cannot be exaggerated, both to the association and to the industry in our section. The committee urges that every possible assistance be rendered to the end that the necessary equipment be secured and the work completed. The Oregon Agricultural College is the only school in the Northwest that has a nucleus of a high-voltage testing laboratory and it should be assisted in its efforts to enlarge this nucleus to proportions that will be of a value both to its students (future engineers) and to utilities operating in the Northwest.

The committee recognized and has gone on record as appreciating the fine co-operation and very material assistance rendered by the engineering faculty and students of the Oregon Agricultural College.

In conclusion the committee desires to acknowledge the able assistance and co-operation rendered by the president, and by the secretary throughout the past year.

Accident Prevention Committee Report*

The accident prevention committee has not held any meetings during the year. The work has been done chiefly by correspondence, but the chairman has had several opportunities to hold conferences with different members of the committee at which the work of the committee has been discussed.

National Co-operation

The committee has kept in close co-operative contact with the national committee throughout the year, the chairman being an ex-officio member of that committee.

Two subjects were referred by the national committee to this local committee: safe practices pamphlets and tree pruning.

With regard to safe practices pamphlets the prevailing opinion among the members of this committee was that members would make little use of such pamphlets and the time and trouble in preparing them would not be justified when the benefit accruing to members was considered.

With regard to tree pruning, suggestions were submitted and were given consideration by the national subcommittee on underground and overhead systems. This committee also was asked to report on methods of identification of cables. This was done, report being made to the underground and overhead systems subcommittee.

The Washington Water Power Company was asked to report on its methods of temporary safety grounding. This it did, and no doubt other member companies furnished similar information.

The chairman was appointed a member of the underground and overhead systems subcommittee which was appointed to investigate and report upon protective methods particularly with reference to overhead and underground systems. This subcommittee has had under consideration the two subjects referred to above.

The national accident prevention committee is not following the plan of assigning definite subjects to any one divisional committee for report, but is handling all its subjects through subcommittees. The same subjects may be assigned to two or more divisional committees for report to the subcommittee.

The national committee has held six meetings during the year, two of them during the group meetings of the Technical Section at Detroit and at Kansas City.

This committee was not represented at Detroit, but the chairman was present at the Kansas City meeting.

In the opinion of the committee the Kansas City committee meeting was a failure; only the national chairman, two members of the committee, one alternate and four conferees were present. This fiasco no doubt was due to the fact that for some unaccountable reason another meeting was called for the following week in New York and the leading men in the committee stayed away from Kansas City.

The committee is of the opinion that the national committee is too intensive in its work. It desires to initiate a subject in the fall and have it completely covered by a report by the middle of the winter. It is probable that no difficulty is experienced in getting all data desired from the eastern companies on account of the large staffs in all their departments and the close association which these companies have with one another, but such a condition does not exist in the territory of this association. We cannot on account of our condition do things that way.

Insull Medal

During the past year three Insull medals have been awarded to employees of member companies.

On Dec. 1, 1925, the chairman acting as Samuel Insull's representative presented a medal at Medford, Oregon, to Howard Dynan, an employee of The Cali-

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* **J. B. Finken**, The Washington Water Power Company, chairman. **Eastern Oregon Light & Power Company:** J. B. Brokaw. **Idaho Power Company:** E. C. Kiersted. **Mountain States Power Company:** W. B. MacDonald, Walter Smith. **Pacific Power & Light Company:** G. I. Drennan. **Puget Sound Power & Light Company:** E. H. Worthen. **Utah Power & Light Company:** F. E. Hansen. **Portland Electric Power Company:** C. F. Young.

fornia Oregon Power Company for the successful resuscitation of a fellow employee, B. T. Green, on June 3, 1924.

On Jan. 25, 1926, G. B. Horning, vice-president and general manager of the Utah Gas & Coke Company, acting as Mr. Insull's representative presented a medal at Salt Lake City, Utah, to C. V. Catron, an employee of the Utah Power & Light Company for the successful resuscitation of George Denning, a farmer at Iowa, Idaho, on March 24, 1925.

On March 30, 1925, at Klamath Falls, Ore., Ted Montgomery, an employee of The California Oregon Power Company, successfully resuscitated a fellow employee, Andrew Folsom. A medal has been awarded to Mr. Montgomery, but it has not yet been presented.

The committee considers it advisable again to call the attention of the member companies to the Insull medal.

This medal is awarded by Samuel Insull of Chicago to any employee of a member company who has, by the Schaefer prone-pressure method of resuscitation, restored natural breathing to a person who has succumbed to suspended respiration as a result of electric shock, and who has by the prompt and intelligent application of this method prevented the death of such person from suspended respiration due to electric shock.

In cases where the person has been so resuscitated and after an appreciable lapse of time succumbs from other causes such as burns or bodily injury, awards will be made the same as though the person had survived.

Either the employee performing the resuscitation or the employing company should report the case to the chairman of the accident prevention committee who will furnish the necessary application blanks, make an investigation of the circumstances and report to the national committee.

The committee strongly urges that all company members insist that all their employees be instructed and trained in principles and practices of the Schaefer prone-pressure method of resuscitation.

Hay-Derrick Hazard

The committee is not yet ready to submit a full report on the hay-derrick hazard. A considerable amount of additional data on hay-derrick accidents has been secured during the year and the committee recommends that these data, with such other data as can be secured, be used next year in compiling a complete report.

The committee again would recommend that the association take steps to secure legislation covering the moving of hay derricks, in the interest more of the farmers and their employees than of the member companies, in the belief that the data available is sufficient to justify the enactment of remedial legislation.

Radio Aerial Hazards

The committee is not yet ready to submit a full report on the radio aerial hazard, but believes that this can be done early next year. Many fatalities have been reported during the year and while most of the member companies are doing all in their power to prevent accidents from this cause, they can be only partially successful owing to the lack of legislative rules governing the erection of radio aerials.

A particularly distressing accident, which resulted in the death at Vancouver, Wash., of 7-year-old James Greenwood, was the subject of a circular issued by H. P. Coffin, manager Public Safety Section, Columbia Basin National Safety Council and approved by C. A. Rich, superintendent of public schools, Portland, Ore.

This circular, addressed to school principals of school district No. 1, Portland, Ore., read as follows:

Last week a school boy touched a wire lying on the ground. Instantly 2,200 volts of electricity passed through his body and he fell over dead. This wire had been fastened to fir trees to serve as a radio antenna. Between the tree and along the road several wires of an electric company were strung on poles. During a storm the trees were blown back and forth and the wire was broken and fell over the service line and the current passed down the broken wire into the ground.

Wires on the ground or hanging down are extremely dangerous. Boys and girls should not touch them, but call up the police or fire bureau and report the location of the broken wire.

Many places in our city radio wires have been strung unlawfully and if broken are liable to cause death or serious injury to anyone coming into contact with them. Your attention is called to the following section of ordinances covering the stringing of wires:

Ordinance No. 32923; Sec. 1, Art. VII: Erection of Poles and Wires—"It shall be unlawful for any person to erect any pole or stretch any wires in, under or over any street, alley, park, public way or public ground for any purpose whatsoever unless a permit or franchise therefor has been granted by the council."

Electric Code No. 3501; Par. E.—"No antenna or counterpoise shall be constructed over a street or public property, over or under any electric-light or power wires of any circuit of more than 600 volts or any railway trolley or feeder wires, without a permit so to do having first been granted by the council and then only in accordance with such requirements and safeguards that shall be contained in such permit."

Please have this letter read in every room of the school of which you are in charge, at your earliest convenience.

This circular was read in each school room and to each platoon of police.

At the annual general meeting of the Technical Section two very interesting and instructive papers were presented and discussed.

M. E. Arkills, safety engineer, Waterfront Employers of Seattle, in his paper entitled The Economic Value of Accident Prevention proved very conclusively that accident prevention activities paid dividends.

G. I. Drennan, a member of this committee, gave a very interestiign paper on Selling Safety.

The committee urges that all executives of member companies read these papers and the discussion. By doing so ways may be seen whereby operating costs may be reduced.

Attention also is called to two opinions, both in the same case, handed down by the supreme court of the state of Oregon under date of March 16, 1926.

The facts in the case were:

A member company operates and maintains a power line in Oregon, and in constructing and operating said power line the same was built across a tract of land occasionally used as a public park and which was situated near a school ground. In constructing the line it was necessary to remove the top from a large tree and in doing so a portion of the tree, approximately 16 ft. in height, was left standing.

On the day of the accident to a youth of the age of 12 years, a group of children had repaired to the tract of land upon which the tree was located for the purpose of having a picnic. Several of the boys climbed the tree, and one came in contact with the wire and lost his life. By reason thereof judgment has been entered against the power company for approximately $12,000. The court in deciding this case, applied what is known to the law as The Attractive Nuisance Doctrine which is applied in a great number of cases such as turn-tables, swimming pools, fish ponds, etc. In other words, the court held the defendant in this case liable on the grounds that the tree left as it was, was an "attractive nuisance" and charged the defendant with knowledge of knowing the usual propensity of children to climb trees.

Because the users of the service of public utility companies must of necessity pay all the costs of furnishing that service this decision, which is now the law in Oregon, imposes an additional burden on those citizens of the state who desire to make use of the service.

Electrical Apparatus Committee Report*

The apparatus committee during the year just closing has functioned as in previous years in a two-fold manner. It has acted as the northwest geographic divisional representative of the apparatus committee of the N.E.L.A. and as such has aided the national committee in collecting data on subjects being studied. It also has worked on several subjects of local interest some of which were used as a basis for the apparatus committee program presented at the general meeting of the Technical Section held in Seattle, Wash., March 11-12, 1926.

Work with National Committee

Several of the subcommittees of the national apparatus committee sent out questionnaires asking for

* **D. W. Proebstel**, Portland Electric Power Company, chairman. **Idaho Power Company:** T. A. Purton. **Mountain States Power Company:** George McClellan. **Northwestern Electric Company:** W. C. Webster. **Pacific Power & Light Company:** C. S. Knowles, E. R. McClung. **Portland Electric Power Company:** E. A. Woodhead. **Puget Sound Power & Light Company:** Joe Hellenthal. **Utah Power & Light Company:** Walter Hendron. **The Washington Water Power Company:** Richard McKay.

data relative to performance, maintenance and operation of several classes of electrical apparatus. Some of them asked for data which might be used to bring about the betterment of apparatus, while much of it had little but statistical value. Some of the subjects commented on below may be of special interest.

Oil Sludging in Power Transformers

The subject of oil sludging in high-voltage power transformers is one that is attracting widespread interest. The national apparatus committee therefore is attempting to determine the relative improvement that may be gained in regard to oil sludging by using the conservator or gas-filled type of transformer instead of the open type. Nearly all of the operating companies in the Northwest have experienced trouble with oil sludging in nearly all of their non-conservator, open-type transformers, and little or no sludging in the conservator types. Nearly all of the latter type, however, are new units and have not been in operation long enough perhaps for bad oil sludging to develop. Experience with oil in the open types has brought about a general plea for improvement in the quality.

This study is a new one and considerable time will be required to accomplish the improvements desired.

Power Factor Improvement

This problem always is before the national committee for the reason, it would seem, that no satisfactory solution can be found. It has been divided into two parts, power-factor or voltage regulation at distribution stations, and the practice of limiting directly or indirectly the power factor characteristics of small a.c. motors on distribution circuits.

The companies in the Northwest in general are using synchronous condensers or other synchronous apparatus to aid in maintaining regulation at central distribution stations. This is common practice and is valuable with respect to station voltage regulation and the lessening of losses on transmission lines and outlying generating plants, but does not provide the benefits to be desired on the distribution circuits themselves.

In order to obtain these desired benefits it will be necessary to deal with the second phase of the power-factor improvement problem. Very little attention has been given to this part of the problem by the companies in the Northwest due perhaps to the fact that there are very few factories that operate large groups of small or fractional-hp. motors.

Rating of Electrical Apparatus

Inquiry as to the conditions under which apparatus is operated in the Northwest reveals the fact that, in general, the manufacturers' nameplate ratings are accepted and only in a few cases have the operators either over-rated or derated the equipment for voltage, current-carrying capacity or interrupting capacity.

Generators and other rotating machinery usually are operated nearly at rated voltage. High-voltage power transformers seldom are operated above rated voltage, but often below voltage. The receiving transformers in distribution stations, however, quite often are operated at voltages in excess of their ratings; 2.4 kv. transformers will be operated 2.4 kv. and 11 kv. transformers from 11 to 11.5 kv. This condition has been brought about as a result from a demand for higher voltage on distribution buses and has in many cases subjected induction regulators rated at 2.2 kv. to continuous operation at voltages considerably in excess of their rating. Many companies, on this account, are ordering regulators for a voltage rating of 2.6 kv. Oil circuit breakers, disconnecting switches, bushings and instrument transformers generally are operated at voltages below their rating.

The manufacturers' current rating of apparatus usually is accepted and seldom increased or decreased by the operator. In some cases, however, transformers and generators are operated at higher current values than those of normal rating because temperatures and other conditions so permit.

Interruption ratings of oil circuit breakers usually are accepted. The operating companies have little means to determine whether or not they should be otherwise. In a number of cases, however, old-type circuit breakers have been considered unsafe for heavy interrupting duty and have been derated and installed in locations where interruption requirements are less.

Questionnaires were sent out by other national subcommittees on several other subjects such as inspection and maintenance of apparatus and equipment, life of generator insulation, and current-limiting reactors. Answers to the first two inquiries show that the policies followed by the several companies with respect to routine of inspection, repairs of equipment and reinsulating of generators differ widely. The national committee no doubt will give some valuable data on these subjects in their progress reports and perhaps will outline some desirable routine methods of inspection and maintenance of electrical equipment. Current-limiting reactors are not in general use in the Northwest geographic district. The demand for their use, however, is growing as the capacity of the systems is increased.

Third Annual General Meeting

The apparatus committee presented its part of the program of the general meeting of the Technical Section of the Northwest Electric Light and Power Association during the afternoon of March 11, 1926. There were presented three papers, one on the subject of Mechanical Troubles with Late Types of Oil Circuit Breakers, by D. W. Proebstel; the second on Differential Protection and Neutral Grounding of Generators and Transformers, by R. Rader of the Puget Sound Power & Light Company; and a third on New Electric Applications in the Paper Industry, by C. W. Fick of the General Electric Company. These papers together with the discussions which followed their presentation will appear in the printed proceedings of the meeting.

The paper on mechanical troubles with late types of oil circuit breakers pointed out that most of the troubles come from insufficient and improperly located oil drains from oil leaks, lack of proper mechanical clearances of the moving parts of closing and tripping mechanisms, contacts, lack of drains in horizontal pipes inclosing operating rods, and from inaccessible parts. While it was pointed out during the discussion that most of these defects have been corrected in oil circuit breakers designed during the past year, much good no doubt will come from calling these defects to the attention of the manufacturers. It will help to prevent their reoccurrence in breakers yet to be designed and presented to the market.

The next paper on the subject of Differential Protection and Neutral Grounding of Generators and Transformers, reviewed the history of relay protection of equipment from internal failure and circuit trouble. It described the principles of differential relay protection and its application to generators and transformers. Grounding of generator Y points and of the neutrals of Y connected transformers was discussed. It was pointed out that the main advantages of differential protection are in minimizing interruptions to service and damage to apparatus.

The final paper on the subject of New Electrical Applictions in the Paper Industry contained several interesting descriptions of departures from long-standing practice in the manufacture of paper. The electrical boiler for generating steam for use in the various pulp and paper processes was described. Comments were made about its convenience and relative economies. It was pointed out that while the cost of electrical energy per pound of steam was much higher than the cost of coal much advantage was gained by a decided reduction in operation and maintenance costs. The substitution of electrical heaters and traveling screens for drying the paper in the paper machines for the long-used steam rolls was vividly described. Another feature of the paper was the description of the super-synchronous motor and its use in driving pulp beaters, grinders, etc., where heavy starting torque is needed. This motor is arranged so that both the field and the armature can revolve in separate bearings. In starting, the field, which is connected to the driving shaft, remains stationary while the armature is brought to synchronous speed. A brake then is applied to the armature giving full running torque to the field for starting the machinery which it drives. The field reaches synchronour speed at the instant the armature stops. This

paper brought out a great deal of very interesting discussion.

Problems Now Being Studied

An interesting problem that has been proposed by the national subcommittee on transformers and regulators is that of attempting to develop standards for 3-winding transformers. There seems to be a growing demand for this type of transformer which may be operated on 3-power circuits in contrast to the now common transformer with a tertiary winding which is used for regulation purposes in connection with a synchronous condenser.

The apparatus committee of the Northwest Electric Light and Power Association has initiated the request that the manufacturers furnish more design data on the nameplates of generators and other revolving apparatus. This matter will be taken up with the manufacturers through the national committee when a complete expression has been made as to what the scope of the data should be.

Inductive Co-ordination Committee Report*

During the past association year there have been no developments of importance in the field covered by this committee. The work of the national committee has been followed with close attention and the interim report on allocation of cost has marked a definite advance in the slow, but sure progress to a complete solution of inductive problems.

The committee was represented during the year at a hearing held by the Public Service Commission of Oregon, at Cascade Locks, to consider complaints received by it concerning interference to radio reception alleged to be caused by the power lines of a local small company. The decision of the Oregon commission appears to be that they are not anxious to accept jurisdiction of radio interference cases, but recognize their responsibility for dangerous construction in the power system. A survey of the local power lines by a member of this committee revealed no serious condition in the power system, but did disclose that the principal complainant before the commission was using a receiving set which radiated very badly.

This committee is glad to be able to report that the field survey of parallels between power and telephone lines, completed several years ago and revised and brought down to date last year for the state of Washington, this year has been extended through the assistance and courtesy of the Pacific Telephone & Telegraph Company engineers to include all parallels between power lines and lines of the latter company in Oregon and Idaho. Owing to the fact that this report is required a month earlier than usual it will be impossible to print the data this year, but it will be forwarded to the national committee and will be available at headquarters prior to the convention of the National Electric Light Association.

* **G. E. Quinan**, Puget Sound Power & Light Company, chairman. **Grays Harbor Railway, Light & Power Company:** H. J. Flagg. **Northwestern Electric Company:** L. H. Kistler. **Pacific Power & Light Company:** H. H. Schoolfield. **Portland Electric Power Company:** W. R. Cornell. **Utah Power & Light Company:** C. R. Higson. **The Washington Water Power Company:** J. B. Fisken, E. V. Olson.

Hydraulic Power Committee Report*

During the year 1925 there was installed in the eleven states adjacent to the Pacific Coast about 300,000 kva. additional capacity of hydroelectric power.

The most important plants completed were:

Pit River No. 3, Pacific Gas and Electric Company	81,000 kva.
Hetch Hetchy, City of San Francisco	80,000 kva.
Baker River, Puget Sound Power & Light Company	39,000 kva.
Lake Cushman, City of Tacoma	37,300 kva.
Copco No. 2, California Oregon Power Company	30,000 kva.
Mystic Lake, Montana Power Company	12,500 kva.

In addition to the above new plants the Southern California Edison Company added a 25,000-kw. unit to its Big Creek No. 1 plant and a 16,000-kw. unit to Big Creek No. 2.

The subject of Hydraulic Packing was assigned to the Northwest geographical division of the association by the national committee.

Considerable data have been collected but the study has not progressed sufficiently to make a final report logical at this time.

Reports to date show the three principal packings used for hydraulic purposes to be braided flax, braided cotton, and Rains metallic packing.

Braided-flax packing has been used more extensively on large hydraulic units than any other type. It is objectionable from the standpoint of wear on the shaft.

Baided-cotton packing is of softer material, absorbs lubricant better, and gives promise of furnishing a more satisfactory packing than the braided flax. The short time it has been in use, however, precludes any definite conclusions.

Rains metallic packing is composed of about equal quantities of soft lead and white pine granules or small chips thoroughly lubricated by boiling in oil. Claims for this packing state that the wear on the shaft is small and that the life is far in excess of other packings on the market. All reports to date on this type of packing have been favorable.

The papers presented at the general committee meeting of the Technical Section held in Seattle, Wash., March 11-12, 1926, comprised a part of the committee's work for the year. On account of the large amount of data included in these papers only a brief abstract will be possible in this report.

Paper on Rock and Earth-Fill Dams by Lyman Griswold

A competent engineer when confronted with the problem of dam construction will first analyze the conditions surrounding the site and after acquiring all of the facts obtainable proceed to design a dam which will at the lowest possible cost produce the greatest amount of revenue by utilizing to the greatest possible extent the resources available.

In the Northwest the most economical development of many of our river systems can be had only by using some dams of the earth and rock-fill type.

Engineers not familiar with this type of construction are apt to assume an element of danger in connection with their use. Engineering history proves that such fears are ungrounded. In two provinces in India there are 90,000 of these dams built to a height of 70 ft. and constructed by natives who had no knowledge of strains or stresses or theories of percolation. They knew by long experience that earth embankments, with the side slopes allowed to take their natural angle of repose, were safe against the pressure of the water.

A properly constructed earth or rock-fill dam with natural slopes of one and one-half to one or flatter inherently is more stable than any of the approved types of gravity concrete dam.

There is no evidence of the failure of an earth or rock-fill dam of any importance except where inadequate spillway capacity has permitted the structure to be overflown, when its immediate failure is inevitable.

The essentials for a satisfactory earth or rock-fill dam are much the same as for any other type excepting that foundation requirements are much simpler. It seldom is necessary to excavate the bed of a river preliminary to constructing a dam of this type. The Rimrock Dam, which is of rock and earth fill, is 230

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ft. in height and rests on 110 ft. of river silt, sand and gravel.

Paper on Economics of Hydroelectric Design by C. P. Dunn

Here in the West we are confronted with the task of choosing the best from among a great many possible hydroelectric developments. Our duty to the communities we serve demands that the water power and irrigation projects of the district be developed in the proper order and in the manner which will result in the greatest good to the greatest number of people.

We always must keep in mind that the thing of prime importance is system efficiency, not machine or station efficiency. Good hydraulic, mechanical, and electrical efficiency is not enough; commercial efficiency in its broadest sense, must be achieved.

Correct solutions of the broader economic problems of hydroelectric design are obtained only by studying the loads and generation of the entire system or geographical district. Due consideration must be given to the fact that the greatest economy usually is obtained when a part of the generation is steam, even in this locality where water-power sites are so abundant.

The value of a kw-hr. is determined not by the fact that it is a definite amount of energy, but by the ability or inability of the seller to deliver it, on demand, at any hour of the day or night or at any season of the year. Electric service consists of carrying both peaks and kw-hr. The mention of either without a very specific definition of the relation between the two results in an incomplete description of the service in mind. The quality of service which will be demanded of a plant has a very definite and very important bearing on the design of the structure and mechanisms of which it is composed. This is the very fundamental of plant design; a power station should be built to fit the work it will have to do.

Before undertaking the detail design of a project it is necessary to get a comprehensive picture of the problem as a whole in order that the proper relative importance of things may be established. These things are as follows:

1. Rating of existing system.
2. Load forecasting.
3. Determination of general construction program.
4. Determination of general features of individual project.
5. The value of power.

The committee prepared for the national committee data covering the mechanical reliability of water-power plants throughout the Northwest together with the answering of various other questionnaires of a lesser nature.

During the ensuing year the committee will continue its study on hydraulic packing.

Overhead Systems Committee Report*

The activities of the overhead systems committee during the past year as is customary have been directed along two general lines, a consideration of problems of local interest and co-operation with the national overhead systems committee.

The outstanding accomplishment of the past year has been the completion of the tests of pin-type insulators of the 13-kv. class by the electrical engineering students of the Oregon Agricultural College under the supervision of Prof. F. O. McMillan.

The idea of having these tests made was conceived about two years ago and the subject has been one of live interest ever since. Lack of adequate transformer equipment will prevent the completion of the tests on the 44 and 66-kv. insulators this year. Replies to a questionnaire sent to all members of the committee relative to live-line maintenance methods reveal the fact that but one company does any work on lines carrying more than 13 kv. and that company limits such work to the replacement of defective insulators and occasional crossarms. One or two more companies do a limited amount of work on lines of the 6.6 and 13-kv. class, but confine such work to the minimum necessary to keep the lines in service without interruptions.

Practically all larger companies belonging to this association use some method of testing insulators on live lines such as the Johnson, Iler or Doble sticks. It generally is conceded that while this method is far from infallible, many defective insulators are located and removed before they have totally failed and many interruptions are averted.

At the beginning of the association year the matter of having comparative tests made by these methods at the Oregon Agricultural College was considered. The principal idea was to determine, if possible, to what extent the personal equation might affect the results obtained. There seems to be some contention between some of the manufacturers of this equipment relative to infringements of patents and we think it advisable to postpone these tests for the time being.

Questionnaires on maintenance methods and practices, and practices relative to overhead crossings of railroads have been sent out to the member companies at the request of respective chairmen of subcommittees of the national overhead systems committee. Replies were forwarded to the proper parties.

Virtually no data have been collected relative to the life of treated and untreated poles. Committee members reported difficulty in collecting the desired information. This matter was discussed at the general meeting in Seattle and better understanding of the subject obtained and it is assured that something may be accomplished during the next year.

This committee was represented at two of the meetings of the national overhead systems committee by Z. E. Merrill at the meeting in Detroit and by R. R. Robley at the meeting in Kansas City.

The national committee has issued no serial or other reports up to the time that this is written. Consequently, there can be no review of its accomplishments.

Next year's work should see the completion of the insulator tests under Professor McMillan's supervision, providing that the proper transformer can be obtained.

The collection of data relative to the life of poles also should bring some definite information.

The chairman believes that this committee would be of more value if each member would, at the beginning of the year, submit some subject for consideration and also make use of the committee as a clearing house of ideas regarding individual problems which may arise from time to time.

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* **J. B. Brokaw**, Eastern Oregon Light & Power Company, chairman. **California Oregon Power Company:** C. D. Wood. **Coast Power Company:** L. W. Edwards. **Idaho Power Company:** T. A. Purton. **Northwestern Electric Company:** D. A. Hard. **Oregon Agricultural College:** F. O. McMillan. **Pacific Power & Light Company:** R. J. Davidson. **Portland Electric Power Company:** H. R. Wakeman. **Puget Sound Power & Light Company:** M. T. Crawford, A. C. Riggs. **Utah Power & Light Company:** P. P. Ashworth. **The Washington Water Power Company:** L. R. Gamble. **Western Electric Company:** H. J. Billica.

Prime Movers Committee Report*

The work of the prime movers committee during the past year has been devoted to the preparation of data requested by the national committee as well as to the study of local problems. These local problems are:

Equipment for handling hog fuel.

Furnace design applied to present hog-fuel burning practices.

Operation of mechanical soot blowers on hog-fuel fired boilers.

Packing for centrifugal pump shafts and turbine control-valve stems.

General trend of heat-balance control in the Northwest.

Possibility of the utilization of low-grade western lignites in the form of powdered fuel.

Review of the causes of caustic embrittlement.

All of the foregoing subjects with the exception of the last two were presented at the general committee meeting held in Seattle, Wash., March 11-12, and are included in the proceedings of that meeting.

Two written discussions were prepared, one on the paper entitled Furnace Design Applied to Present Hog-Fuel Burning Practices and the other on Operation of Mechanical Soot Blowers on Hog-Fuel Fired Boilers. The former discussion was prepared by J. E. Yates, assistant chief engineer of the Pacific Power & Light Company, Portland, Ore. The latter discussion was prepared by Darrah Corbet, associate manager of Chas. C. Moore Company, engineers, Seattle, Wash. Due to the lack of time at the Seattle meeting it was impossible to present these discussions and they are included herewith.

In conclusion the committee recommends the continuation of study along the lines of this year's work and urges a greater co-operation between the various member companies in ironing out their problems encountered in the handling and burning of hog fuel.

* C. C. Simeral, Portland Electric Power Company, chairman. Grays Harbor Railway, Light & Power Company: W. S. Hills. C. C. Moore & Company: H. S. Bastian. Mountain States Power Company: W. C. McLagan. Northwestern Electric Company: Tom Perry. Pacific Power & Light Company: J. E. Yates. Puget Sound Power & Light Company: E. W. Seckendorff, R. S. Carroll.

Discussion on "Furnace Designs Applied to Present Hog Fuel Burning Practices"

By J. E. YATES

The use of sawmill refuse or hog fuel as it is commonly known as a fuel under boilers for the generation of steam has been restricted largely to the northwest section of the United States. It is in this section that timbering operations make this type of fuel available and in some sections it has largely supplanted coal or oil as a boiler fuel, because of its abundance and consequent cost advantage.

Problems in connection with the utilization of this kind of fuel of necessity must be confined to the territory where it is available. This means that users of hog fuel for the generation of steam assisted by interested manufacturers must work out their own problems.

Public utility companies in the Northwest and particularly those operating properties on the western slope of the Cascade Mountains have realized the utility of sawmill refuse as a fuel and today are depending upon this type of fuel to supply a good percentage of their steam requirements. Consequently the information contained in this paper relative to improved designs in hog fuel furnace arrangements is very encouraging.

The Pacific Power & Light Company has one steam plant containing 1,800 hp. in boilers where sawmill refuse is the main fuel for the boilers, the arrangement being such that oil is available as an emergency fuel. The boilers are equipped with dutch ovens, flat arches and level grates. Fuel is fed intermittently into the top of the ovens, using four cones for each furnace. The bridge wall at first was built on an incline having a slope of approximately 60 deg. inclined away from the fuel pile in the oven. This bridge wall recently was rebuilt to a vertical wall, its height decreased and pier and wing walls added. The addition of this refractory has improved combustion conditions in the furnace by quicker ignition of the fuel and a better mixing of the gases. This was accomplished without restricting the throat opening. The velocity of the gases over the wall is not excessive.

Observation after this refractory had been added indicated an increased boiler evaporative capacity of from 145 to 190 per cent of the manufacturers' rating with the same intensity of draft available at the boiler damper, a decrease in the degree of care and manual labor on the part of the firemen, and a decrease in the stratification of the gases.

It would appear that the inclined grate furnace with an even depth of fuel the entire width of the furnace would give better combustion results than the cone method providing the same area of exposed refractory can be maintained and a good mixing of gases secured. The sloping grate would make a hot fire near the foot of the grate where the fuel is burning briskly and a cooler fire toward the top where the fuel is just igniting and where the moisture in the fuel is evaporating. This condition might cause stratification of the gases. If the operating companies have had any experience along this line it would be interesting to have further discussion on the subject.

A. O. Jackson has a patent on a process for burning hog fuel that admits air through a draft door below the grate and fuel bed causing the carbon to burn instead of melting down on the grate bars or passing unburned through them into the ash pit. The fuel gases rising from the fuel are mixed with air coming from a second draft door above the fuel bed, resulting in a complete combustion of the fuel.

Mr. Jackson has equipped a tow-boat with a hog-fuel furnace patterned after his ideas and it was demonstrated on the Columbia River before several engineers late in 1925. This tow-boat is a rear-wheel propelled, steam-operated boat equipped with two 700-hp. Ballin boilers having dutch ovens which are automatically fired with hog fuel. About one and one-half hours is required to get steam up from a cold boiler.

Hog fuel is delivered into the dutch ovens through tubes having a revolving shaft in the center, to the bottom of which is fastened a conical-shaped casting which rests on a cast-iron circular grate. The fuel accumulates on this grate in conical form with the depth on the grate regulated by a telescoping feed tube controlled from the top of the oven. On this particular installation the fuel cone is restricted to a 42-in. diameter and the depth of the fuel at the rim of the cone is regulated to a depth of 2 in. It burns freely up to the edge of the cast-iron cone resting on the grate which is about 30 in. in diameter. Air is admitted through doors below the combustion chamber and the heated gases pass upward through the tubes. The cast-iron cone revolving and the downward flow of the fuel force ashes from the grate.

No performance data are available on this furnace, consequently nothing more can be said about it at this time. Some temperatures were taken during the demonstrations that would indicate a maximum temperature somewhat in excess of 2,200 deg. F.

So far Mr. Jackson has had no experience in installing more than two fuel-cones in one oven.

Forced draft is not necessary with this installation, neither did the grates appear to clog or heat. The incoming air tends to keep the grates cool; in fact the draft made the space between the settings the coolest place on the boat.

At the present time the claim is made for the furnace that it saves operating expenses over the previous oil-fired furnace. In this respect it is typical of a good many hog-fuel installations. About the only specific thing known about the use of sawmill refuse under boilers in this district is that it is more economical than other types of fuel.

Discussion on "Operation of Mechanical Soot Blowers" on Hog-Fuel Fired Boilers

By DARRAH CORBET

I am well acquainted with the performance of soot blowers in the plants of the Northwest and I agree that, in some cases, their economical performance can be questioned.

Before we closed contract with the Long-Bell Lumber Company for its power plant at Longview we very frankly told them how soot blowers were regarded by the electric companies in this district and took their representative to various plants and showed him the results that were being secured. Nevertheless, the Long-Bell company decided to install soot blowers and we are pleased to note they are satisfied with their performance and report favorably upon them.

Practically all of the plants reported on by Mr. Perry have Stirling boilers and it is my judgment that, on account of its design, the Stirling boiler will free itself quite readily from the light soot deposit incident to mill-refuse fuel. However, if there may be intermittent firing with other kinds of fuel, such as oil, it is very desirable to remove the soot entirely before firing oil as otherwise it is apt to fuse to the heating surface.

There are various other types of boilers which do not free themselves from the light wood-ash as does the Stirling boiler. With these boilers mechanical soot blowers show up to better advantage than on the Stirling. This is particularly noticeable in boilers having the tubes very close together such as the old Shipping Board boilers. There is a plant in Seattle where I installed mechanical soot-blowers which gave excellent service with mill-refuse fuel where previously it had been necessary to get in periodically and actually saw out the ash and slag.

The harder a boiler is fired the more desirable are mechanical soot-blowers. I believe they should be installed on all boilers that are expected to operate at very high ratings.

I believe Mr. Perry has overlooked many features of the mechanical soot-blower when he states that their only justification may be the fuel saving which they effect. I would say that in addition to the fuel saving they might be justified by reason of the additional capacities which they help secure, the saving in repair and up-keep, the elimination of danger of ash accumulation causing corrosion and possible subsequent leakage, a saving in labor, and ability to get up steam rapidly in emergencies.

I know of many instances where there is a decided accumulation of ash and soot on the boiler or superheater surface where mill refuse fuel is fired. A mechanical means for removing this would be desirable. The writer would be able to refer to many plants where sawmill refuse is fired and where the best of service is secured from mechanical soot-blowers.

Underground Systems Committee Report*

The committee considered the advisability of studying the design and installation of high-voltage cable for the past year's work. However it was decided that inasmuch as several high-voltage installations were proposed and under construction in the East at the present time it would be better to await the operating results obtained from these installations and reserve this study and report for next year's work. The committee decided to base its study upon two subjects: Auxiliary Underground Apparatus other than Cable and Proper Ventilation of Transformer Vaults and Duct Lines.

X-Ray Cable Tests

In addition to the results obtained from studies on the above subjects some very interesting data on use of X-rays in determining the condition of cable insulation were received from M. T. Crawford, superintendent of distribution for the Puget Sound Power & Light Company. Mr. Crawford's report is as follows:

This development of the use of X-rays on cable was the outgrowth of an extensive series of failures on a 6.6-kv. rubber-insulated unleaded armored submarine cable which was installed from Des Moines to Vashon Island in 1917. It was found that there were a number of air pockets or gas bubbles in the wall of the rubber insulation at places, the result of imperfect vulcanization at the time of manufacture.

This cable was about 12,000 ft. long and laid in salt water, reaching a maximum depth of about 750 ft. We had to install a new cable alongside it to get satisfactory results and now we are about to install two more submarine cables from Richmond Beach to President Point on the Olympic Peninsula, crossing the channel where it is about four miles wide and with water depth close to 800 ft. These cables are to operate at 15 kv. On account of the trouble we had with the old cable and the necessity for reliable operation on the new installation we made an extensive investigation of all phases of the work including the making of satisfactory high-voltage rubber splices. In connection with this work the use of X-rays was developed by F. E. DeSilvia, general foreman underground lines for our company.

The perfect vulcanization of rubber is quite an art if uniform results are to be counted upon. Therefore we made a large number of test splices employing various methods. Mr. DeSilvia took a number of these together with samples of cable to one of the regular X-ray laboratories in the city and had X-ray photographs made for the purpose of determining whether or not all air pockets had been eliminated. As yet we have not used this method for examining splices made in the field, but now are investigating the practicability of doing so in connection with the new installation.

The X-ray will show clearly only voids or gas pockets in the rubber, decentralization of the conductor, or rough spots and imperfections in the conductor surface. The objections to it are the cost and the fact that only one plane is visible at each photograph, making it necessary to rotate the conductor to explore other planes or cross sections.

No doubt other applications of this method may be found later, such as finding the causes of insulator and equipment failures without tearing down or breaking up the materials and thereby destroying the evidence.

* E. F. Pearson, Northwestern Electric Company, chairman. Northwestern Electric Company: S. B. Clark. Portland Electric Power Company: J. M. Gillham. Puget Sound Power & Light Company: C. H. Hoge.

At the general meeting of the Technical Section of the N.W.E.L.&P.A. held in Seattle March 11-12, two paper were presented.

Review of Papers

One paper entitled Constructive Criticism and Suggestions for Future Developments of Underground Distribution System Apparatus other than Cable was presented by J. M. Gillham, superintendent of the underground department of the Portland Electric Power Company. He was assisted in the presentation of this paper by J. S. Volpe, an engineer of the Portland Electric Power Company. A prepared discussion on this subject was presented later by C. H. Hoge, construction superintendent of the Puget Sound Power & Light Company. The reason for presenting a paper on this subject was the fact that the committee thought that the manufacturers have not given suffi-

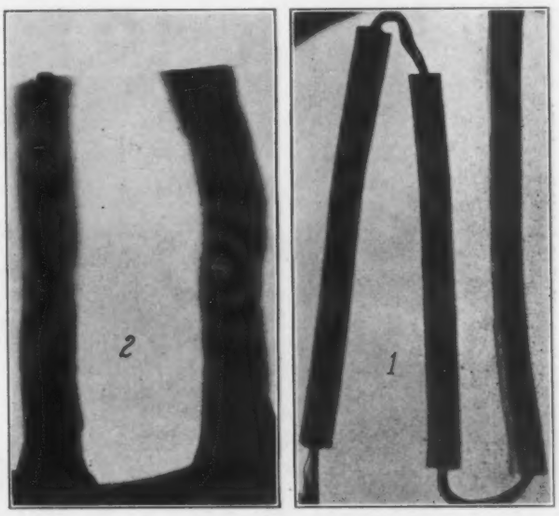


Fig. 1 shows what was accomplished. A piece of the original cable with the long gas pockets in the rubber formed by poor vulcanization and adhesion of the layers applied in the stripping machine at the factory, and the consequent opening up is shown at the right. An imperfect splice, the conductor being considerably decentralized, is shown at the left.

cient thought to the development of underground apparatus such as circuit breakers, oil switches, fuses, and auxiliary apparatus. The paper and ensuing discussion called attention to several improvements that should be made in circuit breakers, oil switches, oil fuses, junction boxes, and other auxiliary underground apparatus.

The paper also brought out the facts that in general there is very little information published on underground engineering, principally because the men engaged in this work have not felt inclined to write their experiences for the benefit of the industries at large. Very little has been taught on this subject in schools and the young engineer has been obliged to get his information from practical experience supplemented by occasional magazine articles and the results of N.E.L.A. technical meetings. The paper was discussed further by J. B. Fisken of The Washington Water Power Company, H. H. Schoolfield of the Pacific Power & Light Company, O. L. LeFever of the Northwestern Electric Company, and F. L. Rohrbach of The Washington Water Power Company and others. Mr. Fisken complimented the writer on presenting a short and interesting paper and at the same time sounded a note of warning that enthusiasm in the subject of underground construction should not lead the various utilities to install underground equipment as opposed to overhead equipment except where absolutely necessary. This resulted in a somewhat spirited discussion for and against underground systems as opposed to overhead systems.

The chairman believes that this is strictly an economic question and should be so considered. In other words there is a definite place and time for an underground system as well as for the overhead system. Obviously it would not be proper to install an underground system where the less expensive overhead system would produce practically the same results at a lower cost. It is realized, of course, that the larger municipalities have in the past and in the future probably will arbitrarily require companies to place certain congested districts underground. Utilities should be prepared with a competent engineering force to design and construct a practical and economical underground system when needed.

A paper entitled Underground Transformer Vault Ventilation was presented by S. B. Clark, superintendent of the underground department of the Northwestern Electric Company. A prepared discussion on this paper was presented by F. L. Rohrbach of The Washington Water Power Company. The paper and ensuing discussions provided considerable data on the experiences of the companies in the Northwest and in addition supplied data obtained through the circulation of questionnaires to utilities in the Southwest. The paper goes at length into transformer-vault wall heat-radiating values and the proper cubical space which should be allotted per kva. transformer capacity. It also outlines ventilating experience and makes recommendations on natural and mechanical ventilation systems for transformer vaults. Several members intended to discuss this matter but due to the limited time it was necessary to close the meeting after the prepared discussion had been submitted. It is the opinion of the chairman that this subject is one of vital importance to those utilities serving large metropolitan areas and that the problem is one that presents increasing difficulties as time goes on. It is believed that this paper and the discussion which followed will assist in the solution of some of the problems at least.

As the above papers together with the discussions will appear in full in the printed records of the technical meeting held at Seattle March 11-12, it was decided not to include them in this report. They may be obtained from the printed report of the Seattle meeting or the chairman will be very glad to furnish copies of these papers to anyone desiring them.

The chairman believes that this meeting was one of the most successful ever held. It was well attended and it is believed that those present appreciated the data submitted.

The chairman wishes at this time to express his appreciation of the efforts put forth by the various members of his committee in so ably presenting their papers, and to the other members of the committee who prepared discussions on the papers.

Upper Falls hydroelectric station of The Washington Water Power Company; capacity 10,000 kva. Plant is on Spokane River right in the heart of the city of Spokane

IDEAS FOR THE CONTRACTOR

Electrical Estimating for the Contractor — XI

Round and V Belt Problems Considered in this Article Complete Data on Belting, Shafting and Pulleys

By J. R. WILSON*, Quality Electric Company, Los Angeles

To have complete data on belting, shafting and pulleys a few tables pertaining to round and V belts, and the computation of pulley and shaft speeds

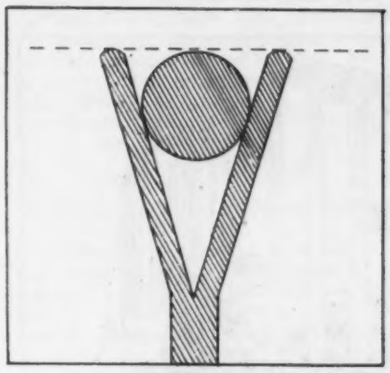


Fig. 1

Table 2

Width (In.)	Ply	Oak (In.)	Nutan (In.)
5/8	3	4½	3½
¾	3	5	3¾
¾	4	6	4
1	4	7	4½
1¼	4	8	5
1¼	5	12	8

should be considered. While the estimator seldom will have need for data on round and V belts, it is almost impossible to obtain these data when needed. The data herewith are offered with that thought in mind.

The following rules and tables cover round and V belt drives with an angle between 29 deg. and 45 deg. While these types of belts are used on small machines such as sewing machines, small lathes and drills, etc., the data given are worked out to 9 hp. maximum for V belts and 14 hp. for round belts.

The right "center distance" to make a satisfactory drive is dependent upon the ratio of the two sheaves and particularly upon the diameter of the smaller sheave. Table 1 gives the recommended center distances for V belting. In using V belting several rules must be observed if the drive is to prove satisfactory. These rules are given below:

1. Never exceed a maximum of 3,000 ft. per min. for V belts.
2. If the center distance is too long it will allow the slack strands to sway, and if the speed is above 1,500 ft. per min. the belt very likely will jump off the sheaves.
3. The minimum pitch diameter for V-block belts is given in Table 2.
4. A 28-deg. sheave will transmit the most power but may not be the most suitable for a particular installation. A belt which is pliable will tend to wedge down into the sheave and this will cause changes in the pulley ratios.
5. Multiple-strand drives will not prove satisfactory because of the uneven wear upon the individual strands, this causing the pitch or diameter to vary. If more than one strand is necessary the best practice is to use a Lenix drive and a flat belt.

Below is given an example of a V-block belt drive. This is a drive for a compressor. The details are as follows:

5¼ in., pitch diam. motor sheave.
3 hp. motor rating.
1,150 r.p.m., motor speed.
1,580 ft. per min., belt speed.
21 in., pitch diam. compressor sheave.
2½ hp., compressor rating.
287 r.p.m., compressor speed.

Find required belt size and center distance.

Refer to Table 3; at 3 hp. with belt speed of 1,580 ft. per min. the size of belt is 1¼ in., 4-ply. Dividing 21 in. by 5¼ in. gives a ratio of 4:1, which is our sheave ratio. Refer to Table 1; on the 4:1 ratio line, with 5¼ in. for

Table 4

(Horsepower rating of round belting.)

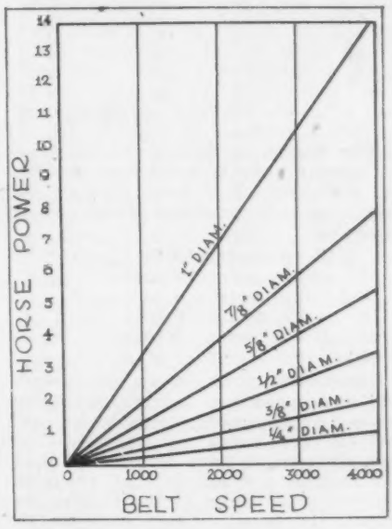
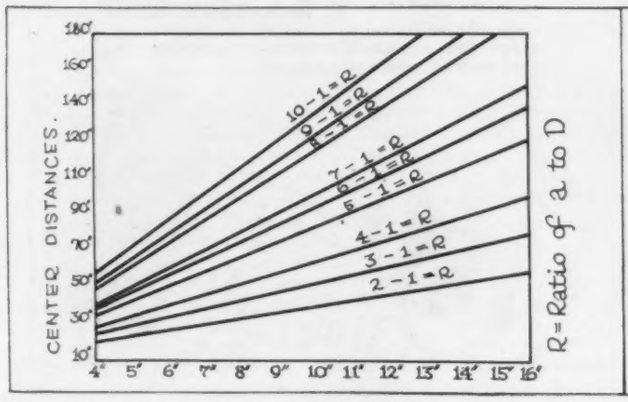


Table 1

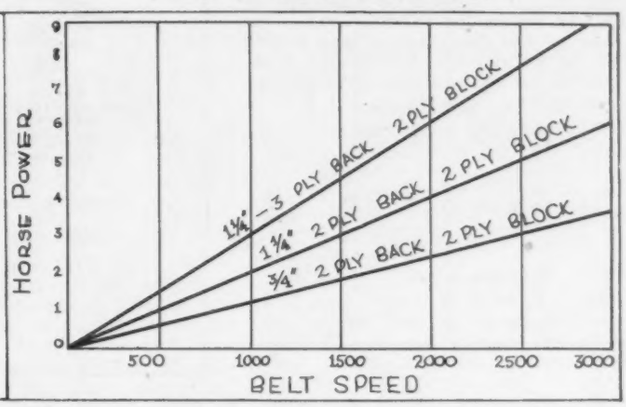
(Recommended center distances for block V belting.)



Recommended center distances for various diameters of the smaller sheave and different sheave ratios. Follow vertical line corresponding to diameter of the smaller sheave to its intersection with the ratio in question. Following the horizontal line to the left will give the center distance.

Table 3

(Horsepower rating for block V belting.)



Power transmitting capacity of a V belt is found on the line marked "horsepower" opposite the intersection of the vertical belt speed lines and angular lines representing the size of the belt. Make corrections for arcs of contact of less than 160 deg.

* All rights reserved by the author.

smaller sheave, at left we find 33 in., as the center distance.

Table 4 shows the capacity of round leather belts at various speeds and sizes. For belts up to ½ in. diam. 45 deg. sheaves will prove the most satisfactory. If the belt speed is over 1,500 ft. per min. the groove in the sheave should be deep enough to allow the top of the belt to be at least flush with the top of the sheave, and deeper would be better. Otherwise the belt will have a tendency to jump from the sheave. See Fig. 1.

All round belts are not of the same pliability so the proper type of belt must be chosen for the particular size of sheave over which it is to operate. Table 5 gives the minimum size of sheave for three typical types of round belts.

Table 5

(Minimum diam. of pulleys over which various sizes of round belting may be run successfully.)

Diam. of Belt (In.)	Minimum Pulley Diam. Solid Round Belt (In.)	Folded Twist Belt (In.)	Patent Round Belt (In.)
⅛	1½	½	.....
3/16	2	1	.....
¼	2½	1½	.....
5/16	2¾	2	.....
⅜	3	2½	.....
7/16	3¼	3	6½
½	3½	3½	7
⅝	.....	4	9
¾	.....	5	11
⅞	.....	6	14
1	.....	6½	18

—Link Belt Co.

The maximum safe speed at which to operate belts is considered as 5,000 ft. per min. For good practice the following belt reductions should not be exceeded:

1/15	hp. motor	15 to 1.
1	hp. motor	10 to 1.
5	hp. motor	8 to 1.
10	hp. motor	6 to 1.
20	hp. motor	5 to 1.
50	hp. motor	4 to 1.

Calculating pulley sizes and speeds and ratios between pulleys to obtain desired shaft speeds seems to be very difficult for some estimators. The formula used is very simple and does not require a great deal of effort to memorize. If three of the factors are known, the fourth is very easy to calculate. Of the four factors, two are for speeds and two are for diameters. Where only two of the factors are given, the third must be assumed, in order to obtain the fourth.

Any of the four factors may represent the unknown quantity. To illustrate this point, consider the formulas given below:

$$\text{Formula 1:}\quad \frac{D \times S}{s} = d.$$

$$\text{Formula 2:}\quad \frac{d \times s}{S} = D.$$

$$\text{Formula 3:}\quad \frac{D \times S}{d} = s.$$

$$\text{Formula 4:}\quad \frac{d \times s}{D} = S.$$

Where d, diam. of driven pulley.
Where D, diam. of driving pulley.
Where S, r.p.m. of driving pulley.
Where s, r.p.m. of driven pulley.

To understand the use of the formula let us solve a problem based upon one of the above formulas:

Given: D, 4-in.; S, 1,800; s, 200.

To find: d, diameter of the driven pulley.

Solution: Use formula 1, $d = \frac{D \times S}{s}$

$$d = \frac{4 \times 1{,}800}{200}$$

d=36-in., diameter of the driven pulley.

By substituting known factors for those assumed above, the formula is applicable to all pulley problems.

Editor's Note: The author is indebted to C. A. Schieren Company for tables and figures used in this article.

Ordinance Requiring Metal Service Passed.—An electrical ordinance requiring an all-metal service has been passed in Compton, Calif.

The Harper Electric Company, Orange, Calif., has been sold to **Charles L. Alt.** Mr. Alt will conduct the business under the name of the **California Electric Company**

Advertising of Jobber Advocates a Quality Wiring Job

Quality wiring installations are being advocated by the entire electrical industry through the Red Seal plan of adequate wiring. The wire, switches, and every piece of equipment are included in a quality job.

The accompanying reproduction of a newspaper advertisement of the Graybar Electric Company is tying in with this program in selling a real job. It calls the attention of the public to the fact that the unseen part of an electrical wiring installation is an important consideration when an entirely satisfactory job is wanted. This type of advertising is aiding the contractor who does only quality work.

The "dickey," or shirt that was all front, is a thing of the past. So is the electrical wiring job that just had to look pretty. People want the real goods all the way through.
No "dickey" methods in this wiring job-
WHEN you have your house wired, don't be satisfied with a "dickey" job. Like the shirt with a false front the electrical installation with a false front can't hope to cover your requirements.
Out of sight— but not out of mind
For 100% service out of electric light and power, your electrical contractor will tell you that the wiring supplies you can't see—behind the walls—are just as important as those you can see.
Graybar backs up your contractor with quality supplies for the whole job.
At our office he can get quick service on quality electrical supplies—the kind that will play a part in your day-by-day satisfaction with the job.
A typical toggle switch. Back of it are all these parts—and they all have to be made right and put together right.
GraybaR
QUALITY
Electrical Supplies wholesale only
GraybaR
ELECTRIC COMPANY
SUCCESSOR TO SUPPLY DEPT. Western Electric

The necessity of having material of the highest quality for the entire electrical installation was brought to the attention of the public in this newspaper advertisement of the Graybar Electric Company.

Uniform Electrical Ordinance Is Urgent Need

Protects Public and Assures Stability of Administration to Owner, Contractor and Manufacturer

(Contributed)

Since the advent of electricity and its application and up until about twenty years ago electric wiring and devices could be installed in any manner suited to the choice of the owner. The authorities were not interested; the municipal inspector was rare, if he existed at all. There was but one factor which tended to prevent actually hazardous installations—the National Electrical Code—designed primarily for the purpose of protecting fire insurance companies and specifying how various kinds of electrical equipment and accessories should be installed in buildings of various classes.

It was not incumbent upon a builder to observe this code. If he did he could secure a lower insurance rate. If he chose to insure himself, or carry no insurance, the code meant nothing. It had no police power and was merely a commercial arrangement which was satisfactory as far as it went. Its specifications furnished protection to insurance risks and standards which guided the commercial operations of builders and electrical manufacturers.

The Code with Police Power Behind It

As a result of the "Safety First" movement which swept over the country during the first few years of this century, and the enactment of workmen's compensation laws by many states, ordinances were put through in a great number of cities for the purpose of controlling and regulating the installation of electric wiring and devices in buildings within their jurisdiction. These ordinances carried with them the appointment of inspectors to see that the regulations were complied with.

Under these conditions the building owner no longer could make observance of electrical installation regulations a matter of his own choice. Municipal police power now told him what he must do in the interest of public safety.

Although the purpose of these regulations and the spirit behind their enactment are entirely laudable and represent an effort to reduce the loss of life and property by fire, the results, as carried out in practice, are quite unsatisfactory. In place of one recognized code, which had previously guided the builder, contractor, electrical manufacturer, and public utility, a large number of codes came into existence, each varying as to its specifications and each with police power behind it. Politics and the personality of inspectors were given an opportunity to intrude themselves upon the problem, and this they did.

Injury to Public Through Multiplicity of Codes

With a great number of cities each promulgating its own code, even based as they must be on the older National Code of the fire underwriters, a multiplicity of regulations must follow, each with the public safety in view but unavoidably differing in detail. Where a condition such as this holds, the result is confusion and a waste of patience, time, and money.

Serious Effect on Electrical Industry

To realize the effect of this multiplicity of codes on the electrical manufacturer, just call to mind the enormous economy of large-scale production of standardized products. With varying codes, specifying varying details for equipment or devices for the same purpose, a single standard product will not meet requirements. There must be a number of products, almost exactly alike and unnecessarily differing in detail; hence the impossibility of large-scale standardized production. The manufacturer in a case like this passes on the effect of increased production costs to the consumer. In other words, a multiplicity of codes means higher prices.

Further than this, such conditions are a distinct hindrance to progress in development of the electrical industry and tend to raise prices through restricted competition.

Uniform Electrical Ordinance a Simple Remedy

The problem presented by the above conditions would be cleared up by the general adoption of a uniform state statute and municipal ordinance covering the necessary provisions for the administration of adequate specific rules and regulations governing the installation and inspection of electrical equipment.

The Electrical Manufacturers' Council, after careful study of the conditions to be met, in order to obtain this much needed result prepared its Uniform State Statute and the Uniform Electrical Ordinance for the guidance and use of various governmental regulatory bodies.

These documents are short, the scope of the municipal ordinance being indicated by the following section headings:

1. Electrical Inspector.
2. Appointment, Salary and Duties of Electrical Inspector.
3. Right of Access to Building.
4. Permits.
5. Inspection.
6. Re-inspection.
7. Construction Requirements.
8. Records of Permits and Inspections.
9. Review.
10. Penalty.
11. Repeal of Conflicting Ordinances.
12. Enforcement.
13. Responsibility of Owner.

In addition, there is an optional section which provides for the licensing of electricians and may be used when and where deemed advisable.

The Two Codes

Section 7, Construction Requirements, is the heart of the ordinance. This section states that "No certificate of inspection shall be issued unless the electric light, power, and heating installations are in strict conformity with the provisions of this ordinance, the statutes of the state of * * * *, the rules and regulations issued by the industrial commission of * * * * *, under the authority of the state statutes, and unless they are in conformity with the most approved methods of construction for safety to life and property. The regulations as laid down in the National Electrical Code, as approved by the American Engineering Standards Committee, and in the National Electrical Safety Code, as approved by the American Engineering Standards Committee and other installation and safety regulations approved by the American Engineering Standards Committee, shall be prima facie evidence of such most approved methods."

It is to be noticed that this clause has been worded very carefully so that the power of the state or municipality to control its own rules and regulations has not been interfered with, but the regulations as laid down in the codes referred to are made prima facie evidence of the most approved methods and thereby gain the legal and moral support of the states and municipalities. Rules under the codes required by purely local conditions are not prevented.

In explanation of these codes: The National Electrical Code which covers fire protection was drawn up by the Electrical Committee of the National Fire Protection Association and promulgated by the National Board of Fire Underwriters. The National Electric Safety Code, which covers casualty protection, is the work of the Electric Safety Conference and the U. S. Bureau of Standards. Both codes were nationalized, owing to their being prepared in accordance with the procedure necessary to receive the approval of the American Engineering Standards Committee. It is the thought and experience behind these codes and their national character which gives great value to the Uniform Electrical Ordinance and makes it worthy of acceptance by all municipalities.

Favorable consideration is being given to the adoption of this ordinance by many municipalities. Everywhere its presentation is being met with great success, as it conforms to the requirements of governmental bodies and assures stability of administration to the owner, contractor, public utility, and electrical manufacturer by providing for uniform installation methods. The public receives its great benefit in adequate protection to life and property at a minimum cost.

U. S. Court Upholds Resale Price Suggestion by Manufacturer

Manufacturers may suggest a resale price to the dealer and then refuse to sell to dealers who do not maintain the suggested price, according to the gist of a decision of the United States Court in the eighth district. The case was that of the United States v. Richard Hudnut.

Previous decisions of the courts had held that any agreement between the dealer and the manufacturer to maintain a resale price was a violation of the Sherman Anti-trust Act. The attitude of the dealer is the only difference in the two cases. In the latter case the dealer agrees to the resale price and also observes it.

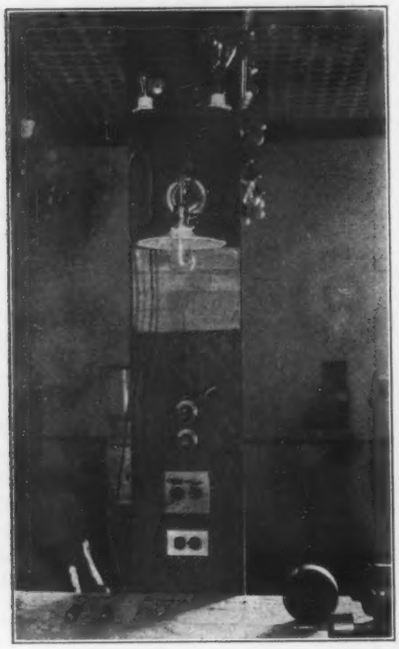
S. B. Goodman's log cabin home on Yosemite Avenue, in a setting of fir trees and mountain shrubbery, is one of the most unique and attractive Red Seal homes in Fresno, Calif.

This new home of Dr. D. H. Trowbridge is complete in electrical equipment. Contrasting this with the modest home on the left, the extreme applications of the Red Seal Plan are evident.

Convenient Testing Arrangement Designed by the Contractor

E. J. Gartley, electragist of Bakersfield, Calif., has provided a handy layout in his store for testing appliances and small motors.

A drop cord has been equipped with two prongs on one end. The equipment on the shelf above the bench in Fig. 1 consists of a 10-watt lamp, a small transformer, a bell and a 200-watt lamp. The single convenience outlet near the bench supplies 6-volt current with the bell in series with it. The open outlet immediately below this supplies 110-volt current and is used for testing lamps or irons. The left-hand outlet of the duplex group below this supplies current with the ten-watt lamp in series with the appliance; the outlet on the right with the 200-watt lamp in series. The lower duplex convenience outlet is connected directly on the 110-volt circuit.



Convenient arrangement supplying 6 and 110-volt current for testing appliances and small motors.

One circuit protected by one set of fuses is used to supply current to all of the testing equipment. The fuses are placed in a steel can in order to eliminate any danger. If desirable, a layout similar to this also might be supplied with 220-volt power. In his work Mr. Gartley has not found this to be necessary.

Electragists Display Exhibit Urging All-Metal Code

The members of the California Electragists at Glendale, Calif., displayed a booth at a merchants' exposition held in that city, in which they had prepared an exhibit designed to show the public the dangers of faulty electrical work. The exhibit was of an educational nature and advocated an all-metal standard of electrical wiring.

The principal feature of the exhibit, in addition to show cards carrying short sayings advocating a conduit installation, was the display showing defective materials and parts taken from buildings in which they had caused fires.

Literature explaining the benefits accruing from an all-metal standard was distributed to visitors at the exposition. The results of the display have been gratifying as a number of people have asked for an inspection of their residences, and it is also expected it will aid in the passage of an ordinance covering an all-metal standard of electrical wiring to apply in all parts of the city.

This is the section educational exhibit displayed by the Glendale electragists, the other being a traveling window display.

Fig. 1. Exhibit advocating an all-metal standard of electrical wiring which was displayed at a merchants' exposition in Glendale, Calif., by the electragists of that city.

NEWS OF THE INDUSTRY

Many Papers on Electricity Scheduled for A.S.A.E.

The subject of rural electrification will receive much attention at the annual meeting of the American Society of Agricultural Engineers at Tahoe Tavern, Lake Tahoe, June 23-26.

"Rural Electrification from an Economic and Engineering Standpoint," a paper prepared by L. S. Wing, engineer for the California Farm Bureau Federation, will be presented Thursday morning, June 24.

Other papers on the subject of rural electrification to be included on the program for Thursday morning are: "The Farmer as a Manufacturer," by Arthur Huntington, of the Iowa Railway & Light Company, and chairman of the rural electric division of the society; and "The Relation of Power to Agricultural Production and Profits," by C. D. Kinsman, Division of Agriculturad Engineering, U.S. Department of Agriculture.

A special rural electric program has been arranged for the evening of Wednesday, June 23. The subjects to be discussed at that meeting are: (1) "Rural Line Characteristics; Improving Load and Diversity Factors," by Franklin J. Zink, assistant engineer, Iowa's Community for Electric Development, and F. D. Paine, assistant director, Committee on the Relation of Electricity to Agriculture; (2) "Poultry Conditions on the Farm as Affected by Electricity," E. A. Stewart, University of Minnesota; (3) "Recent Developments in Electric Brooders," G. W. Kable, Oregon Agricultural College; (4) "Results of Investigations in the Application of Electricity to the Dairy Industry in California," B. D. Moses, University of California.

Anyone interested in the program of the society is being extended a cordial welcome to attend and take part in the discussion. Further information may be secured by writing to L. J. Fletcher, secretary of the Pacific Coast Section, A.S.A.E., Davis, Calif.

Commencement of Lewiston, Ida., Development Announced

The recent letting of a contract for the construction of a power dam, forebay dike, power house and tailrace on the Clearwater River, near Lewiston, Idaho, to Winston Brothers, contractors, Minneapolis, presages early commencement of the joint power and sawmill development at Lewiston. (Journal of Electricity, April 15, 1925, p. 297.) Principals in the development are the Clearwater Timber Company, a Weyerhaeuser company, which will build a mill with a capacity of 200,000,000 ft. annually, and the Inland Power & Light Company, affiliated with the Pacific Power & Light Company and Northwestern Electric Company, Portland, which will develop 10,000 kw. The work contemplated in the present contract, which was let by the power company, will create a forebay for the power development and a log pond for the sawmill. The contract covers practically the entire power development with the exception of installing the electrical machinery.

The dam is to be a comparatively low diversion dam, 35 ft. high, and about 1,000 ft. long. It will contain a fish ladder and log chute, and 925 ft. of spillway section containing two Taintor gates, three needle beams gates and three roller gates set between piers resting on a concrete base. These gates will control a flow 50 per cent greater than ever has been recorded in the Clearwater River under extreme flood conditions. An earth-fill dike extending about 7,000 ft. parallel to the river and across the flat will then sustain the diverted water in a forebay covering some 400 acres of existing fruit and truck farm land. It will be necessary to re-locate about two miles of Northern Pacific Railway Company tracks along the south side of the forebay where natural hills will form the south shore.

The power house will be located in the dike at the west end of the forebay. Here short steel penstocks will carry the water through two 7,000-hp., S. Morgan Smith water wheels direct-connected to 5,000-kw., Allis-Chalmers generators. The plans allow for a draw-down of the forebay water sufficient to take care of daily peaks. Here likewise is provided a second spillway section for water control, and a tailrace 4,500 ft. in length will be excavated to carry the water back into the Clearwater River. The sawmill will be situated below the forebay on property adjacent to the power house.

An outdoor transforming and switching station will provide the terminus for a 66,000-volt tie line to the Clarkston, Wash., substation of the Pacific Power & Light Company, some three miles distant, from which the Lewiston district is served. This will tie the new plant in with the Yakima-Walla Walla, Wash., power system of that company furnishing a new source of supply on the extreme eastern end of that system. The new power house will be about one mile east of the city limits of Lewiston, and the dam is to be three miles from the confluence of the Clearwater with the Snake River.

Power Company Installs Electric Furnace.—The San Joaquin Light & Power Corporation, Fresno, Calif., is having installed an electric furnace for drill heating at 2,400 deg. F. The furnace, which is being built by James H. Knapp, Los Angeles, will be equipped with Globar heating elements manufactured by the American Resistor Corporation.

Petitions Out for Water and Power Act

Circulation of petitions to have the Water and Power Act placed on the ballot at the November election began last month in a number of California cities. Solicitors with the petitions were in evidence at places which would enable them to catch crowds.

Supporting the Water and Power Act in its third attempt to become a part of the constitution of the state are the same group which has supported the measure in the past two campaigns, namely: Rudolph Spreckels of San Francisco, Dr. John R. Haynes of Los Angeles, William Kent of Kentfield, James D. Phelan and Paul Scharrenberg of San Fhancisco, and Louis Bartlett of Berkeley. Franklin Hichborn, executive secretary of the California Water and Power Act League, the Spreckels organization for the promotion of the measure, is in charge of the campaign again.

The Water and Power Act twice was defeated overwhelmingly by California voters, the first time in 1922 and again in 1924, each time by over two to one majority. It is understood that the present act has not been changed in any respect from that proposed on the previous two occasions (see Journal of Electricity, May 15, 1926, p. 491), and that the campaign to have it approved by voters will be based upon the same arguments and contentions as of former attempts. In launching the act, Mr. Hichborn reiterated former charges against power companies, made reference to Ontario, and denounced as misrepresentation the efforts of power companies to give the public their arguments against the act.

Long Beach Electrical and Radio Dealers Exhibit at Fair

Almost a score of electrical and radio dealers and maufacturers participated in the sixth annual Harbor Industrial Exposition, Auto and Radio Show which recently was held in the Municipal Auditorium at Long Beach, Calif. The display included many electrical appliances, such as refrigerators, washing machines, vacuum cleaners, ironers, and other household devices, and many of the booths staged demonstrations. The Southern California Edison Company had an attractive booth where hot biscuits, baked on electric appliances, were served to visitors. This exhibit received a certificate of award.

In the radio section nine exhibitors had displays. A silver cup for the best exhibit in that section was awarded The Belmont Radio Studio, and silver medals for special merit to the F. O. Lantz Company and the McCrery Music Company.

The exposition was well attended.

Puget Sound Company Women Form Association

Organization of the Women's Co-operative Association of the Puget Sound Power & Light Company in Seattle, with seventy charter members, has been announced by Miss Nelle Duffy, permanent chairman. Miss Nina L. Carson was elected secretary. The first meeting was held in the Hotel Gowman, at which R. M. Boykin, manager of the Seattle district, and Col. H. C. Winsor, personnel officer, were guests. W. D. Shannon, engineer in charge of constructing the new Baker River development, made an address illustrated with lantern slides.

Objects of the new organization are declared to be: to provide better opportunity for advancement of women employees and prepare them for greater responsibilities; to educate members in public speaking and to provide opportunities for vocational education as a means of advancement.

Customer-Ownership Program Is Continued by Utility

After disposing of 15,000 shares of its new 6½ per cent cumulative preferred stock in twenty-three days (Journal of Electricity, May 15, 1926, p. 493), The Washington Water Power Company, Spokane, authorized an additional allotment of 15,000 shares of the same stock in order to continue its customer-ownership program.

The stock is being sold at its par value of $100. The company opened its subscription books on April 7 and acquired approximately 1,300 new stockholders through its efforts during April. The experience of The Washington Water Power Company in offering its first preferred stock has broken previous sales records of utility stocks in eastern Washington. The company has increased its capitalization to $40,000,000 in order to issue the preferred stock.

Declares Refrigerator Mergers Solely for Economy

Explaining the purposes behind the merger of several electric refrigerator companies, Arnold H. Goss, president of the Electric Refrigeration Corporation, which was formed last year as a merger of the Kelvinator, Nizer and Grand Rapids refrigerator corporations, declared that he welcomed investigation. He said:

"The motive behind our merger was not an endeavor to eliminate or reduce competition, nor an endeavor to evade anti-trust laws, but solely for the purpose of gaining economy of operation through the co-ordination of competent divisions participating in all branches of the electrical refrigeration industry."

Prizes for Merchandising Methods Offered by E. N. Hurley

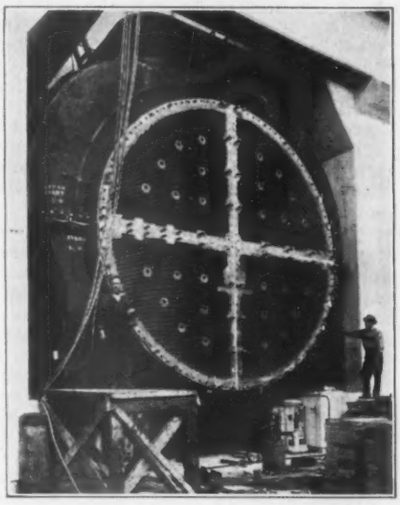
An offer of $10,000 to be distributed in three prizes to the electric light and power companies that during 1926 make the most constructive contribution toward developing a more effective method of merchandising electrical household appliances was received from E. N. Hurley, president of the Electric Household Utilities Corporation, Chicago, during the N.E.L.A. convention at Atlantic City, May 17-21. The amount is to be divided as follows: first prize $5,000, second prize $3,000, and third $2,000.

The offer was accepted on behalf of the National Electric Light Association by E. W. Lloyd, Commonwealth Edison Company, Chicago, chairman of the Commercial National Section.

San Francisco Manufacturing Companies Consolidate

The Stewart Electrical Manufacturing Company and the Electrical Sheet Metal Works, both of San Francisco, have consolidated with the Frank Adam Electric Company of that city. The new company will be known as The Stewart Works of the Frank Adam Electric Company. It will manufacture and sell FA panel boards and Stewart safety-type dead-front switchboards for distribution on the Pacific Coast. For the present the Electrical Sheet Metal Works will remain at 81 Shipley Street and the Stewart panel board works at 59 Columbia Square.

The personnel of the new company is as follows: manager—J. T. Stewart, sales manager—Edward Lang, sales engineers—Lee Van Atta and Frank Rivers; superintendent—R. E. Grimes.



A 75,000-sq.ft. condenser in process of installation at the Long Beach plant of the Southern California Edison Company. It is designed to pass cooling water at the rate of 100,000 gal. per min. and to condense 600,000 lb. of steam per hour. More than 50 miles of 1-in. tubing provides the cooling surface.

Gates Closed and Storage Begun at Exchequer Dam

The Exchequer Dam of the Merced Irrigation District's irrigation and power project on the Merced River in California is finished; the gates have been closed and storage has begun in the reservoir, which has a capacity of 280,000 acre-ft. (Journal of Electricity, Dec. 15, 1925, p. 467.)

On May 4 the total head of water behind the dam was 190 ft., with a total storage of 64,000 acre-ft. By that time all the machinery had been assembled in the power house and the plant was scheduled to be ready for regular service by June 1. The finishing touches on the construction work are to be done and all the construction equipment removed by about the middle of July.

Cancel Water Rights on Campbell River, Vancouver Island

The Water Board of the Department of Lands of the Province of British Columbia has terminated the license giving water rights on the Campbell River on Vancouver Island to the Campbell River Power Company, because the company, which has held the license for 16 years, has done nothing toward developing the water power. The board further has reserved the power rights and will not grant a license again until some company or individual presents a plan of development and undertakes to develop and utilize the power. The action of the board can be appealed before the Appeal Court of British Columbia.

During the period that it has held the license the Campbell River company claims to have spent $200,000 in gaging the water, government fees, surveys, plans, traveling and office expenses. It has not developed the power because it desired first to be assured of customers for the use of the power, and these it has been unable to find.

According to the Dominion Water Powers Department, 150,000 hp. can be developed at a low cost on the Campbell River. It is rumored that the Consolidated Mining & Smelting Company of Canada, which owns extensive mineral property on Vancouver Island, and which, through its subsidiary, the West Kootenay Power & Light Company, already has developed 72,000 hp. at Bonnington Falls, near Nelson, B.C., is desirous of acquiring the water rights of the Campbell River, but this rumor has not been confirmed.

Applications for Water Permits Filed in Oregon

Recent applications for permits to appropriate water from Oregon streams, filed at the office of Rhea Luper, state engineer, Salem, include two for power purposes. Carl F. Uhden, Ernest B. Hussey, James B. Dodge and Kenneth G. Harlan, all of Seattle, have applied for permission to appropriate water from Walla Walla River and to construct the Bear reservoir and Elbow reservoir to store approximately 40,000 acre-ft. for irrigation and power purposes in Umatilla County.

The city of Eugene, Ore., has filed for the purpose of constructing the Bear Creek reservoir in Lane County for the storage of 30,000 acre-ft. of water from the McKenzie River and Johnson Creek, appropriating 5,200 sec.-ft. of water from this storage for the development of 71,363 theoretical horsepower at an approximate cost of $4,281,780.

Tacoma Light Department to Furnish Light and Power to Peninsula District.—The Tacoma City Light Department has entered into an agreement with the Peninsula Light Company, organized by residents of the peninsula district of Pierce County, as a mutual corporation to distribute light and power, whereby the light department will finance the construction of a transformer station for the suburban district and be safeguarded against loss in case anything occurs to interfere with the city furnishing the mutual company power. The station will cost about $22,000.

Edison Company Awards Cups to Two Districts in Contest

Marking the close of the second year of competition for the Charles A. Coffin Foundation Cups between the thirty-one geographical districts comprising the territorial divisions of the Southern California Edison Company, the Santa Páula district was awarded the Commercial Cup for being the premier district in the commercial department for the year 1925, while the Fullerton district was awarded the Operating Cup for being the leading district in the operating department.

The commercial department cup is awarded to that district which has shown the highest degree of development in general efficiency and cooperation, collections, sales, public relations, appearance of company's property, and sale of company's junior securities.

The operating department cup is awarded to that district which has shown the greatest efficiency in the following six major operating factors: Construction efficiency, operating and maintenance expense, accounting accuracy and experience, district store operations, labor conditions, and accidents.

R. H. Ballard, executive vice-president and general manager, awarded the cups to C. B. Hutchinson, district manager of the Fullerton district, and L. S. Lothridge, district manager of the Santa Paula district, who received them for their respective districts.

Organization Formed to Aid Institute of Technology

Great encouragement has been given to the faculty of the California Institute of Technology, and a substantial support for its work has been provided by the recent organization of 100 men and women of southern California, who will be known as the California Institute Associates. At a meeting held in the home of Henry E. Huntington recently Russell H. Ballard, vice-president and general manager, Southern California Edison Company, was elected president of this new group, which is being established for the purpose of furthering the research and educational enterprises of the Institute.

The California Institute of Technology is one of the few schools in America requiring a five-year course. Its student body is limited to 500 with liberal provision for graduate work. Outstanding features of the institution are the Gates Chemical Laboratory and the Norman Bridge Laboratory of Physics, given by the two men whose names they bear, and the high-voltage laboratory for the study of electrical engineering provided through the generosity of the Southern California Edison Company.

The new organization of California Institute Associates will supplement the liberal endowments previously made and will make possible an increase in the number of research workers and the necessary additions to laboratory equipment which they will need. Besides Mr. Ballard, the president, the names of many men well known to the electrical industry are found on the list of memberships, including Henry E. Huntington, John B. Miller, William G. Kerckhoff, Harry J. Bauer, Allen C. Balch, Harry Chandler, Henry M. Robinson, Herbert Fleishhacker, Arthur H. Fleming, Fred B. Lewis, Dr. Millikan, Alan E. Morphy and A. N. Kemp.

Dealers Urged to Get In June Bride Campaign

It is estimated that there will be 20,000 weddings in California during June, and that the average number of gifts given to brides is five. Consider also that this is the slow-moving time for electrical appliances, as a rule, and the combination, according to the California Electrical Bureau, provides electrical dealers with an opportunity.

The bureau is making an extensive advertising campaign in the newspapers of the state to foster the idea of giving electrical gifts to June brides. Attractive posters for window displays are available to dealers from the bureau without cost. And to stimulate competition in the June bride activity $125 in prizes is to be given by the bureau for the best window displays carrying out the idea.

The electrical dealer has an unusual opportunity to convert the usual June slump into a profitable season for appliances, according to the bureau.

Tacoma Settles for Construction of Cushman Power Project

Settlement of all claims of A. Guthrie & Company, contractors for the construction of the Cushman Power project for the city of Tacoma, Wash., has been made with a final check of $231,178.47 by the city council. The payment to the Guthrie company closed the contract for the construction of the dam and appurtenant works, the power house substructure and the power house superstructure.

The cost of this project is sufficiently within the original estimate to allow the construction of the spillway and the homes for operators at the power house without running over the figure set, notwithstanding the half million dollars spent in making the project better than originally planned, Ira S. Davisson, commissioner of light and water, states.

The total cost of the Cushman project will run around $5,250,000, it now is indicated. An issue of $4,000,000 bonds was authorized for the project and the remainder will be borne out of the current net earnings of the light department.

Puget Sound Company Buys Lake Rutledge Company.—The Puget Sound Power & Light Company recently purchased the Lake Rutledge Electric Light Company serving the Long Lake and Hicks Lake districts in the vicinity of Olympia, Wash. The trunk line purchased is one and a half miles long and will be extended immediately.

Sales Department Reorganization Announced by Graybar

A reorganization of the sales department of the Graybar Electric Company, recently announced by G. E. Cullinan, vice-president in charge of sales, effects the following changes in personnel in that department: M. A. Curran, assistant to vice-president, formerly manager of the central station department; J. L. Ray, general supply sales manager, formerly manager of supply and equipment department; E. A. Hawkins, general telephone and appliance sales manager; G. F. Hessler, general utilities sales manager, formerly manager line material sales department; G. K. Heyer, assistant general supply sales manager, formerly telephone sales manager; A. J. Eaves, public address and carrier current sales manager; P. M. Rainey, telephone sales manager, formerly sales development manager; G. E. Chase, broadcasting sales manager, formerly broadcasting sales engineer; O. E. Richardson, broadcasting sales engineer; J. W. Skinkle, signaling sales manager; A. E. Hetzner, signaling sales engineer; and A. S. Wise, appliance sales engineer.

These changes in staff personnel will result, according to Mr. Cullinan, in a more specialized organization, necessitated by the great growth of the electrical industry as a whole and more particularly by the expanding activities of the Graybar company.

Grand Forks, B. C., to Construct 1,200-hp. Hydro Plant

The municipality of Grand Forks, B. C., has acquired Smelter Lake and dam from the Granby Consolidated Mining, Smelting, Power Company and will erect a 1,200-hp. hydroelectric plant and an irrigation system. The power will be more than ample for present needs, and the surplus and the irrigation system will be used to attract industrial concerns to locate at Grand Forks and fruit growers to settle in the surrounding country.

The Granby company at one time had a smelter at Grand Forks, but this was closed after the establishment of a smelting plant at Anyox, B. C. The company no longer had use for the dam, which cost more $100,000 to construct, so returned the property comprising a lake of 800 acres to the town, which originally donated it to the company in consideration for the company's erecting a smelter at Grand Forks.

Westinghouse Lamp Company Elects New Vice-President.—At a meeting of the board of directors of the Westinghouse Lamp Company held recently at its headquarters at 150 Broadway, New York, Arthur E. Allen was elected a vice-president and a member of the board of directors to succeed the late T. G. Whaling. Mr. Allen was general manager of the Westinghouse Lamp Company. Although he has been with the Westinghouse Lamp Company but a short time, having been appointed general manager in April, 1925, Mr. Allen has a long record of progress with the Westinghouse Electric & Manufacturing Company.

Westinghouse Sales Department Completely Reorganized

A complete reorganization of the sales department of the Westinghouse Electric & Manufacturing Company, involving the reallocating of the managing personnel and the creating of several new activities has been announced by E. D. Kilburn, vice-president and general sales manager.

The change, which involves all departmental sales managers of the company, consists of the following appointments: assistant to vice-president—E. H. Sniffin, formerly manager power department; director of sales—T. J. Pace, formerly manager supply department; central station manager—G. H. Froebel, formerly manager marine department; industrial sales manager—J. M. Curtin, formerly manager industrial department; transportation sales manager—M. B. Lambert, formerly manager railway department; assistant director of sales—A. C. Streamer, formerly assistant to manager of supply department; generating apparatus manager—H. W. Smith, formerly general engineer; traction apparatus manager—A. J. Manson, formerly manager heavy traction division, railway department; motor apparatus manager—O. F. Stroman, formerly assistant to manager of industrial department; switch-gear apparatus manager—R. A. Neal, formerly head of switch section, supply department; and distribution apparatus manager—G. A. Sawin, formerly assistant to manager of supply department.

The announcement is the culmination of a reorganization of the Westinghouse sales system which has been in course of development for some time. Its effect, according to Mr. Kilburn, will be to form a more flexible organization now necessary to serve and anticipate the needs of electrical apparatus users, due to the tremendous development of the industry.

Changes in Personnel Announced by Edison Company

The following changes in the personnel of the commercial department of the Southern California Edison Company, Los Angeles, have been announced by W. L. Frost, general commercial manager: W. C. McWhinney has been made assistant general commercial manager. A. W. Childs, who has been general sales manager, has been appointed manager of new business. R. I. Carruthers, who has been assistant general sales manager, has been made manager merchandising department. H. C. Rice has been changed from appliance sales agent to assistant manager merchandise department. P. V. Moffat has been made credit manager.

Grays Harbor County Grants Two Franchises to Utility

The Puget Sound Power & Light Company recently secured two franchises from the Grays Harbor County commissioners at Hoquiam, Wash., each for 50 years. One is for running light and power lines on the Wenzell Road near Elma, and the other for additional service in Woodlawn Addition in Hoquiam.

The company has applied to the Lewis County commissioners for a franchise to construct a power line in the Hannaford Valley to serve several coal mines and 17 farms, and for a 50-year franchise for a power line to be built along Ocean Beach Highway from Chehalis River bridge into the town of Walville, a distance of 19.5 miles, thence across Pacific County to the town of Lebam, a distance of 10.8 miles.

Washington Utility's Crews Busy on Transmission Lines

Four crews are now building transmission lines for The Washington Water Power Company. The new 110-kv. line from near Fairfield, south of Spokane, to the Coeur d'Alene mining district of the Idaho panhandle, will be completed in the late summer. A section of this new line now is being operated at 60-kv. from Wallace to Kellogg. The line is designed to replace two pioneer lines in that district which are operated at 60 kv. The double-pole type of construction is being used by the company and extra heavy construction features are necessary in the mountainous district.

About nine miles of the transmission line between Coulee City, on the general Washington Water Power system, and the Chelan and Okanogan Valley district now has been rebuilt. Due to fog from the Columbia River rising to a higher altitude there and congealing on the wires, the company has had some difficulty in the past with this line. A two-pole type of construction with the wires level is expected to eliminate this. The line now is operated at 60 kv. but will be raised to 110 kv. when the Chelan power project is completed. It now is insulated for 110 kv. for 36 miles.

Feeder Line into Oxnard Being Built by Edison Company

Construction of a new 15,000-volt feeder line into Oxnard by the Southern California Edison Company was begun Feb. 2. This line will tap the 15,000-volt Simi line at what is known as Del Norte corner, and will be a wood-pole line about ten miles long. It will provide insurance against interruption of service and also for possible growth of the community.

At present the Southern California Edison Company has but one 15,000-volt line into Oxnard. This line is adequate to carry the load at present, but should service be interrupted by accident or storm there is no alternative feeder line. This condition is to be corrected by the building of the new line.

While the new line will carry 15,000 volts when completed, which will be in about two months, it is contemplated to increase capacity to 60,000 volts within a short time.

Utilities Establish Joint Headquarters in Denver.—Headquarters for the Arkansas Valley Electric Company, Gilpin County Light & Power Company, and Hinsdale Mining & Development Company have been established in the Western Securities Building in Denver under the management of the Stearns interests. A number of smaller cities in the mountains of Colorado are served by these central stations.

Nevada-California Corporation Holds Annual Meeting

At the annual meeting of the stockholders of the Nevada-California Electric Corporation held recently in Denver the following directors, who had served the company during the past year, were re-eletced: Delos A. Chappell, D. H. Coover, George E. Cranmer, S. Nelson Hicks, Edwin S. Kassler, W. E. Porter, Lawrence C. Phipps, Jr., M. D. Thatcher and Arthur B. West.

At the reorganization meeting of the board the following officers were re-elected: president—Edwin S. Kassler, Denver; vice-president—Arthur B. West, Riverside, Calif.; vice-president and treasurer—Lawrence C. Phipps, Jr.; secretary—W. S. Fisher; comptroller—W. C. Simmons, all of Denver. Charles F. Potter is counsel for the company, and Dudley W. Strickland attorney.

A special meeting of the stockholders unanimously voted to increase the authorized common stock from $20,000,000 to $50,000,000 and the authorized preferred stock from $10,000,000 to $50,000,000.

Two New Power Projects Planned in State of Washington

Two new power projects are being planned in Washington, according to recent applications filed with R. K. Tiffany, state supervisor of hydraulics, Olympia.

One seeking an appropriation of 300 sec.ft. of water from the Klickitat River, a tributary of the Columbia River, was filed by the North Dalles Irrigation District of Portland, Ore., which plans a $250,000 power and irrigation project developing approximately 2,400 hp.

The other, filed by L. W. Johnson of Tacoma, asks for an appropriation of 700 sec.ft. of water from the North Fork of the Snoqualmie River for the development of 33,000 hp. under a 500-ft. head. The cost of the project, which will be situated in the eastern section of Snohomish County, is estimated at $2,000,000.

Construction of Third Unit of Bonnington Falls Plant Started.—The West Kootenay Power & Light Company has started on the construction of a third 20,000-hp. unit to its plant at Lower Bonnington Falls, B. C. It is expected that the unit will be put into operation early in the fall. The company is a subsidiary of the Consolidated Mining & Smelting Company of Canada, and the additional power is required to meet the growing requirements of the Trail smelter.

A.I.E.E. News

Seattle Section Elects Chairman.—C. E. Mong, engineer with the Pacific Telephone & Telegraph Company, Seattle, has been elected chairman of the A.I.E.E., Seattle Section, succeeding Prof. Edgar A. Loew. C. R. Wallis of the General Electric Company was named secretary, succeeding Mr. Mong.

News Briefs

B.C. Electric Company to Supply Power for Railway Electrification.—Plans are well under way for the electrification of the Canadian Pacific Railway through the mountains from the Pacific Coast to Calgary, according to recent news dispatches. The British Columbia Electric Railway Company, Ltd., is planning the system that will be used, it is stated.

Big Transformer Shipped to Stanford University.—Shipment of a transformer with a rating of 2,000,000 volts has been made by the General Electric Company to Stanford University, Palo Alto, California. It occupied five freight cars and is valued at $500,000. The transformer will be part of the equipment in the high-voltage laboratory presided over by Prof. Harris J. Ryan, head of the department of electrical engineering at the university.

Southern Colorado Power Company Completes Interconnection Between Plants in Canon City and Pueblo, Colo.—Complete interconnection of the power plants in Canon City and Pueblo, Colo., was completed by the Southern Colorado Power Company recently. According to E. F. Stone, assistant general manager of the company, the 60,000-volt transmission line was installed at a cost of $225,000. Power service of the entire Arkansas Valley of Colorado is obtained from these two steam generating plants and a smaller hydro plant at Skagway.

Portland Company Files for Water on Clackamas River.—Recently applying at the office of Rhea Luper, state engineer, Salem, Ore., for permit to appropriate water from the Clackamas River, Clackamas County, the Portland Electric Power Company, Portland, is laying the foundation for further development in the future of its Oak Grove project, the first unit of which was completed in 1924. The present filing, it is stated, is for the purpose of extending existing water rights formerly acquired at a certain point on the river.

California Railroad Commission to Investigate Electrical Service Rates.—The California Railroad Commission has instituted an investigation on its own motion to determine whether the rates and charges of Pacific Gas and Electric Company for electrical service are unjust and unreasonable and to determine the just, reasonable and sufficient rates and charges for that utility. The matter has been set for hearing before Commissioner Clyde L. Seavey in the court room of the Commission at 10 a.m. on May 5, 1926, at San Francisco. The Commission also has been requested by the city officials of Oakland, Berkeley, Alameda and San Francisco to investigate the rates of both the Pacific Gas and Electric Company and the Great Western Power Company of California for domestic service in those communities.

Pe Ell, Wash., Grants 50-Year Electric Light and Power Franchise.—The city council of Pe Ell, Wash., has granted a 50-year light and power franchise to the Puget Sound Power & Light Company. The Pe Ell system will be rebuilt and improvements costing $10,000 will be made.

Condemnation Proceedings Instituted by Utah Company.—The Utah Power & Light Company has started condemnation proceedings in the federal court against approximately 1,000 acres of land in Cache Valley, Utah, adjacent to the Bear River and its tributaries, the Little Bear and Logan Rivers. It is contended that the land will be inundated in the construction of the reservoir which is an adjunct to the company's new Cutler plant, now in process of construction.

Lumber Company Contracts for Power-House Equipment.—The McCormick Lumber Company, Seattle, recently has signed contracts with the Seattle branch of the General Electric Company for a 1,500-kw. steam turbo-generator set, switchboard and miscellaneous power-house equipment for its proposed mill now under construction at Port Gamble. This order duplicates the purchase recently made by the company for its lumber mill at Port Ludlow.

Power Company Extends Lines Into Farming District.—The Pacific Power & Light Company will make a 5-mile extension of its power lines from Benton City, Wash., into the Benton Highlands district to serve fifty-four ranches.

Permit Granted Puget Sound Utility for Water Storage.—A permit authorizing the Puget Sound Power & Light Company to store 140,000 acre-ft. of water in Lake Shannon for use in connection with the Baker River development of the company, has been issued by R. K. Tiffany, state supervisor of hydraulics at Olympia, Wash. The construction costs are estimated at $100,000.

Additional Details of Hydraulic Equipment for Melones Plant.—Hydraulic equipment for the Melones plant on the Stanislaus River purchased by the Pacific Gas and Electric Company from the S. Morgan Smith Company will include two 17,500-hp. vertical reaction turbines to operate under heads varying from 120 to 220 ft. The turbines will operate at 277 r.p.m. They will be equipped with "Tru-Spiral" plate steel scroll cases and will be supplied with relief valves of sufficient capacity to discharge 100 per cent of the water passing through the penstock.

Northwest Electric Light & Power Association

Spokane Convention to Be Gala Event of Active Year

Preliminary announcement by J. E. E. Royer, assistant general manager, The Washington Water Power Company, Spokane, general chairman of the convention committee, indicates that both national and regional features will be incorporated in the program of the annual convention of the Northwest Electric Light & Power Association to be held at the Davenport Hotel, Spokane, June 14-17, 1926. Among the officers of the N.E.L.A. who will be present are James E. Davidson, president; R. F. Pack, first vice-president; M. H. Aylesworth, managing director, and Isabell Davie, national secretary of the women's committees. Earl W. Hodges, of Henry L. Doherty & Company, New York, also has promised to attend.

The program will include also the following from the Northwest: D. L. Huntington, president; J. B. Fisken, consulting engineer, and W. H. Ude, director of public relations, The Washington Water Power Company; Franklin T. Griffith, president, and A. J. Johnstone, auditor, Portland Electric Power Company, Portland; P. M. Parry, commercial manager, Utah Power & Light Company, Salt Lake; J. G. Hawkins, assistant secretary and assistant treasurer, and L. H. Kistler, superintendent meter department, Northwestern Electric Company, Portland; L. A. McArthur, vice-president and general manager, Pacific Power & Light Company, and Mrs. L. A. McArthur, Portland, as well as many others who will be announced definitely later.

The program proper is designed to eliminate conflicting parallel sessions and entertainment features. Three days are given over to a series of general sessions for business, and the fourth day largely to entertainment. The Monday morning session will be opened by Charles A. Flemming, mayor of Spokane, in an address of welcome to which Mr. Huntington will respond. Mr. Davidson is scheduled for this session as is also the annual address of the president, Lewis A. Lewis, sales manager, The Washington Water Power Company. Succeeding general sessions will be conducted by the various sections as follows: Monday afternoon, Commercial Section; Tuesday morning, Technical Section; Tuesday afternoon, Public Relations Section; Wednesday morning, Accounting Section; and Wednesday afternoon, Women's Committee of the Public Relations Section. Election of officers likewise will be Wednesday afternoon.

The annual golf tournament for the Kilowatt Cup will take place Thursday at the Hayden Lake course, whither the convention will be moved for golf, swimming and other recreation. Other entertainment features include the president's reception Monday evening, a dancing and swimming party Tuesday evening, a dinner dance and program Wednesday evening, besides special plans for the entertainment of the ladies during the three business days of the convention.

News of the Electragists

California Electragists Discuss Work at Sacramento Meeting

Constructive work being done by each division and the progress of the Red Seal plan were the major topics of discussion at the quarterly meeting of the California Electragists, Northern Division, which was held at the Hotel Senator, Sacramento, on May 21.

The executive committee meeting was held at 10:30 a.m. Plans for the state-wide meeting of the California Electragists to be held at the Hotel Del Monte, Del Monte, Oct. 1-3, were discussed. It was decided that Oct. 1 and 2 would be devoted to business with a meeting each morning and afternoon. The evenings and Sunday will be devoted to entertainment. It was suggested that a number of group meetings be held dealing with particular problems such as merchandising, estimating, and motors.

The general open meeting was held at 2 p.m. with C. Felix Butte, vice-president, in the chair. After the report of the executive committee was made he stressed the importance of the state-wide meeting to be held at Del Monte and urged all members to attend.

Progress of the Red Seal plan in California was discussed by Victor W. Hartley, executive secretary of the California Electrical Bureau. He called attention to the value of the plan in raising the general standards of electrical construction. Mr. Hartley stated that 146 Red Seal homes had been built in California during the first three months the plan had been in operation, with an average increase of fifty per cent in the amount of wiring installed. In speaking of the Red Seal home displayed in Sacramento during Better Homes Week he stated it was the first home to be sold, evidencing the sales value of a Red Seal home to the realtors and the building industry. Mr. Hartley stressed the need of a spirit of co-operation between all branches of the electrical industry.

The use of pictures in selling and advertising, as well as in educational work, was discussed by Rollin Smith of the Rollin Smith Engineering Company.

George Eldridge, field representative of the Northern Division of the California Electragists, outlined the work which has been done by the division.

C. J. Geisbush, executive secretary of the Southern Division, gave a very interesting talk on the constructive work which has been done by that division. He stated the credit men of the electrical supply jobbers have been co-operating with the association in its efforts to have electragists install adequate accounting systems. The work of the estimating section in presenting the electragist method of estimating to the members was explained. In discussing the merchandising section Mr. Geisbush stated contact first was made with the power companies and the jobbers; following this the first merchandising institute was held. This consisted of a series of group meetings which were addressed by men selected by the jobbers to tell the story of the sale of electric ranges, proper window display and store arrangement. This was a method of taking the work of the committee to the members.

The June Bride campaign was outlined by Mr. Hartley.

Sixty-five members from the San Francisco Bay territory made the trip to Sacramento aboard the steamer Navajo, leaving San Francisco Thursday night and returning Friday night.

Paul H. Needham, who has conducted his contracting business in Beverly Hills from an office for a number of years past, has opened a new store at 116 Speedway Drive, Beverly Hills.

Contractors' Association Dinner Sponsored by President

Matt Whitney, newly elected president of the Colorado-Wyoming Electrical Contractors and Dealers Association, recently sponsored a dinner meeting in Colorado Springs. The meeting was attended by contractors, executives of the municipal light department and city officials. The purpose of the meeting was to encourage closer co-operation within the industry.

The Red Seal plan was discussed and considerable interest was manifested in it. This activity will be developed as soon as wiring rules and inspections have been perfected.

Southern California Electragists to Meet in San Diego June 26

The next quarterly convention of the California Electragists, Southern Division, will be held at the Hotel San Diego, San Diego, on Saturday, June 26.

Delegates from the immediate vicinity of Los Angeles will leave Los Angeles Harbor Friday, June 25, at 6 p.m. aboard the Ruth Alexander, arriving in San Diego Saturday morning about 8 o'clock.

Regular sessions of the convention will be held in the sun room of the Hotel San Diego all day. By arrangement with the Pacific Steamship Company it will not be necessary to leave the hotel until 11:30 p.m. Saturday.

California Electragists to Hold State-Wide Meeting in October.—Announcement has been made that the annual state-wide meeting of the California Electragists will be held at the Hotel Del Monte, Del Monte, Oct. 1-3. Details of the convention will be announced in future issues of the Journal.

The Exeter Electric Company, Exeter, ran the first Red Seal advertisement in California.

Arthur L. Smith of Seattle has been appointed electrical inspector for the department of labor and industries at Olympia, Wash.

Charles L. Atherton is the proprietor of a new electric store opened at 3713 Sunset Boulevard, Los Angeles. In addition to contracting a complete line of appliances and fixtures will be stocked. Mr. Atherton formerly was with the **California Electric Company** of that city.

Officers of the Colorado-Wyoming Electrical Contractors and Dealers Association formed at the state-wide meeting of electrical men in Denver, Colo., in March

President—Matt Whitney, Colorado Springs.

Vice-president—W. A. J. Guscott, Denver.

Secretary-treasurer—P. Harry Byrne, Denver.

Meetings

B.C. Electric League Finishes Extraordinary Year

In making its annual report recently the Electrical Service League of British Columbia, with headquarters in Vancouver, revealed a year of constructive activity in the promotion of electrical development in its territory which should place it in leading position with respect to electrical leagues. For 1926, after a year of varied activities, the league intends to concentrate upon the Red Seal home idea, according to George Kidd, president of the league. This announcement was made at the recent annual dinner and rally, at which the report of the past year was reviewed.

During the year the work of the league has been devoted to continuation of the convenience outlet and better wiring campaign; a campaign for the improvement of lighting in the stores of Vancouver and vicinity and concentration on the improvement of factory lighting, as well as a very successful home-lighting essay contest in conjunction with the allied electrical industries of the continent.

Improved lighting systems were installed in new homes, apartments houses, churches, garages, bowling greens, gymnasiums, business offices and schools.

That there is a large field in Vancouver for better store lighting was indicated by the results obtained from circulars sent out by the league, which, without any follow-up, obtained 85 requests to revise the lighting in old stores. Those contractor-dealers who followed up the circulars obtained excellent results.

The factory lighting campaign also yielded excellent results. The replies from 300 prospects selected last October indicated such an interest in better lighting that R. Hall, of the B.C. Electric light and power staff, was loaned to the league as field man. Calling on 210 of the selected list, he succeeded in selling new lighting, reflectors or wiring in 65 plants, and, in addition, sold the idea of better lighting to 34 plants which are carrying out the league's recommendations at the present time. This made a total of 99 plants out of the 210, or practically 50 per cent, in which improved lighting systems were installed.

Another important field of new business in lamps and electric load was found in electric signs, which numbered 100 new installations during 1925, with an initial lamp installation of 14,688, which, renewed every 12 months, makes a total of approximately 29,000 lamps, valued at $10,000.

The officers of the Electrical Service League this year are: George Kidd, president; W. G. Murrin, vice-president; advisory council—E. E. Walker, chairman; John R. Read, treasurer; J. Lightbody, secretary; J. F. Little, George Wright, J. H. Willard, George Horsman; S. E. Jarvis, P. F. Letts, A. P. Kerley. J. Hart is the secretary-manager.

Clark Baker Named Head of Bay Cities Chapter I.E.S.

Annual election of officers for the San Francisco Bay Cities chapter of the Illuminating Engineering Society recently resulted in the selection of Clark Baker, Sr., as chairman of the chapter for the new fiscal year. Mr. Baker, assistant manager of the National Lamp Works of the General Electric Company, Oakland, Calif., and widely known for his activities in lighting development, lighting schools and for work on the lighting committee of the Commercial Section, P.C.E.A., was elected by popular acclaim. He succeeds Sam P. Russell, partner of H. B. Squires in the firm of that name, who closed a successful year's administration.

Other officers named were: Harry C. Barnard, Curtis Lighting Company of California, vice-chairman; C. D. Montieth, Pacific Gas and Electric Company, secretary-treasurer; board of managers: S. P. Russell; W. F. Hanbridge, Pacific Gas and Electric Company; Louis F. Leurey, consulting engineer; Leo Gianini, Edison Lamp Works, and George Rucker, Holophane Company.

COMING EVENTS

California Electragists, Southern Division—
Quarterly Convention
Hotel San Diego, San Diego, Calif.
June 26, 1926

Northwest Electric Light and Power Association—
Annual Convention—Spokane, Wash.
June 14-17, 1926

American Society of Agricultural Engineers—
Annual Convention—Tahoe Tavern,
Lake Tahoe, Calif.
June 23-26, 1926

American Institute of Electrical Engineers—
Convention—White Sulphur Springs, W. Va.
June 21-25, 1926

American Institute Electrical Engineers—
Pacific Coast Convention, Salt Lake City, Utah
Sept. 7-10, 1926

California Electragists—
Annual State-wide Meeting—Hotel Del Monte
Del Monte, Calif.
Oct. 1-3, 1926

Electrical Representatives of Sacramento Have Meeting

Representatives of all electrical interests and industries in the region of Sacramento, Calif., met recently at the Hotel Senator for a banquet and discussion meeting. In the more than 100 present were representatives from both power companies serving the territory, the telephone company, labor unions, architects, contractors and dealers, and manufacturers' representatives. The meeting was held to co-ordinate efforts and create enthusiasm for June Bride Week, the Red Seal plan and related problems of wiring.

The meeting proved to be an enthusiastic one, and good results are claimed for it along the lines of getting expressions of co-operation from architects regarding the proper specifications for wiring convenience outlets on all new buildings. The proposed ordinance with respect to wiring specifications also was discussed by representatives from the city of Sacramento electric department.

The meeting proved so successful that it was decided that similar meetings be held every three months for the purpose of discussing electrical problems of the vicinity.

Book Reviews

COILS AND MAGNET WIRE

By Charles R. Underhill, New York. 494 pp. Illustrations, diagrams and tables. 9 x 16 in., cloth, McGraw-Hill Book Company, 1925. $4.

An engineering treatise of exceptional value to designer and coil manufacturer. This volume presents a thorough, systematic discussion of the factors involved in coil design with tables, formulas, and sample calculations. The uniformity of both electrical and physical characteristics of conductors and insulation and the use of winding machinery have enabled the engineer to determine the proportions of his product within very close limits. By reason of this fact, the author has developed numerous tables and graphs which materially reduce the labor of calculation both for original designs and for the modification of given coil proportions to meet altered specifications.

The thorough treatment of the subject of coil-heating and radiation characteristics is one of the outstanding features of the book. In addition, an extended consideration by other authors is given of the properties and uses of insulating varnishes and impregnating compounds.

Concluding chapters are devoted to a discussion of the more common types of windings, winding machines and to the details of coil construction and testing. R. E. T.

Agriculture Committee Issues No. 4 Report.—Progress report No. 4 of the California Committee on the Relation of Electricity to Agriculture, issued recently, contains much valuable data relative to electric poultry brooders. It describes the three types of brooder in use, their characteristics, limitations and advantages, gives valuable tables of tests conducted, illustrates heating methods and computes efficiencies. A report of power rates and schedules and a bibliography of recent publications which bear upon the subject or the relation of electricity to agriculture are also available from this committee, whose headquarters is at the University of California Farm, Davis, Calif.

Safety Rules for the Installation of Maintenance of Electrical Supply Stations—Handbook of the Bureau of Standards No. 6.—This comprises Part One of the Grounding Rules of the National Electrical Safety Code. It is in handy form and published to meet the demand for a small booklet dealing with specific parts of the Code. It should be of interest to many. Obtainable from the superintendent of documents at the government printing office, Washington, D. C. Price 10 cents.

Personals

Dr. Leonard F. Fuller, formerly engaged in carrier-current research for the General Electric Company at Schenectady, N. Y., recently has reaffiliated himself with that company and will be attached to the engineering department as Pacific Coast representative, with headquarters in San Francisco. Dr. Fuller was born in Portland, Ore., where he received his early school training. He was graduated from Cornell University in 1912 with the degree of mechanical engineer. After a short time with the National Electric Signaling Company, Brooklyn, N. Y., known to old-time radio men as the Fessenden Company, he went to San Francisco and entered the engineering department of the Federal Telegraph Company. He was made chief electrical engineer of that company in 1913. He developed and built the high-

DR. LEONARD F. FULLER

powered transoceanic radio apparatus furnished the U.S. Navy under contract during the years 1913 to 1919. During the period 1914 to 1918 he took up graduate work at Stanford University and was given a degree of Ph.D. in 1918. In 1919 Dr. Fuller became assistant manager of the Ohio Insulator Company, Barberton, Ohio, but returned to San Francisco in 1920 to devote his full time to the Colin B. Kennedy Company in the development of radio receiving apparatus. In 1922-1923 he installed the carrier-current telephone equipment on the Caribou line of the Great Western Power Company and the same type of equipment on the Pit River lines of the Pacific Gas and Electric Company, the latter being the longest and highest voltage carrier channels in the world at that time. In 1923 he joined the General Electric Company in Schenectady. Dr. Fuller will devote the greater part of his time on the Pacific Coast to carrier-current telephone, carrier-current switch control and similar work.

Col. H. G. Winsor, head of the personnel division of the Puget Sound Power & Light Company, Seattle, recently made an extended trip East, including Chicago, New York and Boston, where he conferred with Stone & Webster officials.

Miles W. Birkett, vice-president and general manager, and **Lewis A. Lewis,** sales manager, represented The Washington Water Power Company of Spokane at the recent annual N.E.L.A. convention at Atlantic City.

A. K. Baylor, special representative of the General Electric Company, New York, was in Salt Lake City recently in the course of a tour of the Western offices of that company.

R. E. Smith, publicity director, the Southern California Edison Company, Los Angeles, was one of the speakers at a recent meeting of the Electric Club of San Diego.

H. K. Griffin, superintendent commercial department, Western States Gas & Electric Company, Stockton, Calif., paid a visit to San Francisco on business a short while ago.

D. E. Harris, president, Pacific States Electric Company, San Francisco, not long ago paid a visit to the company's Seattle branch.

R. A. Lundquist, chief of the electrical equipment division, Department of Commerce, Washington, D. C., has been appointed export manager of Electric Refrigeration Corporation, Detroit. Mr. Lindquist began his professional career with the Missouri River Power Company, at Helena, Mont., after which he spent some time with the Westinghouse Electric & Manufacturing Company.

J. D. Ross, lighting superintendent for the City of Seattle, addressed the Wynooche Power League of Aberdeen, Wash., a short while ago, urging that city proceed with its proposed municipal power project. **Llewellyn Evans,** superintendent of the Tacoma municipal light department, also addressed the league on municipal ownership of public utilities.

H. L. Bromley, assistant secretary, California Oregon Power Company, Medford, Ore., recently made a three-day trip to Klamath Falls. In that period he presented ten moving picture programs before high school student bodies, lodges and service clubs.

A. B. Day, vice-president and general manager, Los Angeles Gas & Electric Corporation, paid a business visit to San Francisco a short while ago.

J. W. Devereaux, assistant to vice-president in charge of operation Byllesby Engineering and Management Corporation, spent several days with the San Diego Consolidated Gas & Electric Company a short time ago. Mr. Devereaux was making a general survey of all companies under Byllesby management on the Pacific Coast, his itinerary including properties as far north as Tacoma.

Frank Airey, general manager, Pacific States Electric Company, Los Angeles, recently returned to that city after a short visit to San Francisco.

James McNair, of The Washington Water Power Company, Spokane, has been transferred from the engineering department of that company to a position which places him in charge of maintenance and operating work of the light and power department that formerly was handled by the engineering department.

Walter Funfsinn, of the Seattle Lighting Company, recently won the Northwest doubles championship in a handball tournament in Portland.

A. M. Frost, sales manager, San Joaquin Light & Power Corporation, Fresno, Calif., was among the guests present at a recent meeting of the San Francisco Electrical Development League while on a brief visit to that city.

Arthur Wegner has taken up industrial engineering work with the commercial department of The Washington Water Power Company, Spokane, leaving his position in the engineering department of that company.

R. O. Bremmer, city salesman in Spokane for the Pacific States Electric Company, has been transferred to fill a similar position at the branch office in Portland, Ore.

William E. Barrett, formerly manager of the publicity division, Westinghouse Electric & Manufacturing Company, Denver, has been transferred to a similar position in the company's St. Louis territory.

Thomas L. Nudd, formerly electrical engineer with the Allied Architects' Association, Los Angeles, has entered private practice and has opened offices in the H. W. Hellman Building in that city.

J. W. Ryall, of the Mine & Smelter Supply Company, Denver, has been made a member of the advisory board of the Electrical League of Colorado, succeeding **A. E. Bacon.** He also has been elected chairman of the jobbers' section.

Rex Cole, president, The Miller Company, Meriden, Conn., lately spent some time in Los Angeles. **Jack Presbrey** is The Miller Company's representative in that territory.

Ernst Jacobson recently was elected president of the West Coast Power Company, Portland, succeeding **A. Welch,** resigned. Mr. Jacobson came to Portland from Chicago where he had been Western representative of the United Gas Improvement Company since 1923. He entered the public utility field after his graduation from the

ERNST JACOBSON

University of Wisconsin in 1907, and in 1910 became affiliated with the Peoples Gas Company, Chicago, in the engineering department. Later he became assistant engineer, Public Service Corporation of Northern Illinois, Chicago, and still later, vice-president and chief engineer, Iowa Southern Utilities, Davenport, Iowa. In his new position he will direct the affairs of a comparatively young company owning properties in Oregon and Washington that has before it an extensive program of expansion.

M. H. Beekman has been appointed manager of the appliance division of the Edison Electric Appliance Company, Chicago, to succeed **A. H. Jaeger**, who is now with the Kelvinator Company, Detroit, Mich.

J. A. Turner has been appointed supervising engineer in charge of the resident work on the Chelan power project of The Washington Water Power Company, Spokane. Mr. Turner was associated in an engineering capacity with that company when the Post Falls, Long Lake and Little Falls stations were constructed.

H. C. Rice, assistant manager merchandise department of the Southern California Edison Company, recently returned from a two-weeks' tour of the Middle West. Two days of this time were spent at the Frigidaire convention of the Delco Light Company at Dayton, Ohio. During the rest of the trip Mr. Rice visited with the merchandising departments of the larger public utilities and appliance manufacturers throughout the Middle Western states.

E. D. Kilburn, vice-president of the Westinghouse Electric & Manufacturing Company, New York, was a visitor in Salt Lake City recently, inspecting the local branches of his company. Mr. Kilburn was accompanied by **M. R. Cargo**, of Denver, district manager of the Westinghouse company for Utah, Idaho and Colorado.

George E. Lewis, of the Rocky Mountain Utility Information Committee, was one of the speakers at a meeting held under the auspices of the Men's Dinner Club at Fort Lupton, Colo., a short while ago.

F. E. Seaver, assistant secretary of the Los Angeles Gas and Electric Corporation, has been elected a member of the board of directors of that company to succeed **William Van Dyke**, who has resigned because of prolonged absence from the city. Mr. Seaver has

F. E. SEAVER

been associated with the Los Angeles Gas and Electric Corporation since 1907 when he entered the employ of the company as an assistant bookkeeper. He has held successively the offices of chief bookkeeper, superintendent of Los Angeles office and assistant secretary. In addition to his other duties he has charge of stock sales for the company. Mr. Seaver takes an active interest in affairs electrical and is a prominent member of the Los Angeles Electric Club, of which he is past president.

J. F. Pollard, general manager, Coast Valleys Gas & Electric Company, Salinas, Calif., recently made a business trip to San Francisco.

J. D. Ross, superintendent of lighting in Seattle, has gone East on a trip which will include several of the larger cities where he will study new electrical devices for proposed use in enlarging the Seattle distribution system of the municipal lighting department. Mr. Ross took with him a motion picture film depicting the growth of the municipal light plant and showing the Skagit power development.

George H. Eveland, at different times associated with the Pelton Water Wheel Company, the General Electric Company and the United States Reclamation Service, and until recently a member of the organization of the Pacific Gas and Electric Company, San Francisco, has resigned to join the staff of the Constant Angle Arch Dam Company of that city. The latter company at present is engaged in designing and supervising the construction of the Feather River Power Company's Buck Creek plant in Plumas County, Calif., and Mr. Eveland will be designing engineer for the power plant and substation.

Charles Jernegan, of the bond department of H. M. Byllesby & Company, Chicago, spent a week with the San Diego Consolidated Gas & Electric Company not long ago.

Leo M. Dunn, vice-president in charge of staff, and **J. L. Ray**, manager of supply and equipment department of the Graybar Electric Company, with headquarters at New York City, a short while ago spent a few days in Salt Lake City on their way to the Coast.

W. G. Vincent, Jr., vice-president and executive engineer, Pacific Gas and Electric Company, San Francisco, was one of the speakers at a recent community dinner given at Jackson, Amador County, Calif., under the auspices of the Amador County Chamber of Commerce.

Henry Bostwick, manager of the Pacific Gas and Electric Company's San Francisco district, has been elected president of the Rotary Club of that city.

C. A. Miller, formerly sub-foreman of construction of the Twin Falls division of the Idaho Power Company, is now local agent for that company at Buhl, Idaho. In the past Mr. Miller has held similar positions at Glenns Ferry and Caldwell, Idaho.

Francis H. Murphy, illuminating engineer, Portland Electric Power Company, Portland, recently addressed the Greater Portland Association on the subject of "Specialty Store Lighting."

H. W. Emory, of the Collyer Insulated Wire Company, Pawtucket, R. I., recently made an extended tour of the Pacific Coast.

Fred Ueltschi, formerly superintendent of the district garage at Boulder for the Public Service Company of Colorado, has resigned to go to California. Mr. Ueltschi has a record of eighteen years of continuous service in the employ of the power company and its predecessors, and has served in various capacities, among them being substation operator, system switchboard operator and electrician in charge of installation of generating and transformer equipment.

Obituary

Sidney W. Bishop, executive manager of the Electrical League of Colorado, died May 13 in Denver, following an operation for appendicitis. Born in Denver Nov. 12, 1894, Mr. Bishop attended primary and secondary schools in that city and was graduated from the University of Colorado with the degree of bachelor of arts. After graduation he entered newspaper work in Denver, later becoming affiliated with the Great Western Sugar Company. At the outbreak of the World War he enlisted and served throughout and was discharged with the rank of captain. He joined the Electrical Co-operative League, now the Electrical League of Colorado, when it was organized in Denver in July, 1921, and

SIDNEY W. BISHOP

soon afterward became its executive manager. In that capacity he was a fervent worker for the electrical industry in the Rocky Mountain region, and through his efforts the organization which he headed became a factor of great importance. Some of his achievements brought him wide recognition. Among these was the innovation of a "Better Christmas Lighting" campaign, which resulted in hundreds of Denver homes arranging attractive electric effects during the holiday season. Several notable electric home displays were exploited successfully under his direction. His success in designing lighting systems for Denver homes and business houses was so marked that some of them became models and wide attention was drawn to them from the electrical industry throughout the country. As a result he frequently was consulted on lighting problems both in his own and in other states. In addition to his other work he acted as correspondent in Denver for the Journal of Electricity. Mr. Bishop was a recognized leader in the electrical industry in the Rocky Mountain region where his genial personality had gained him many friends. To them and to the industry itself his passing is a great loss. He is survived by his widow and two small daughters.

TRADE NOTES

The Foos Gas Engine Company, Springfield, Ohio, has completed the development of a diesel engine which it is claimed has many improvements. A reduction in physical proportions and weight is said to have been accomplished and the engine to have a speed range approximately double that of other designs. The company claims that the weight of the engine has been reduced to about 50 lb. as against 100 to 300 lb. per hp. in other designs, that it is enclosed completely and its lubrication is completely automatic.

The Edwin F. Guth Company, St. Louis, has perfected a new totally enclosed unit known as Guthlite, which it claims embodies new and distinctive features; is not only artistic in appearance with beautiful contour and excellent decoration, but is most efficient in operation. An adjustable white porcelain enameled reflector directs the light so as to secure a wide distribution with uniform intensity on the working plane. Guth spring globe-holding device firmly holds globe without rattling. The manufacturer claims Guthlite is suitable for almost any installation and may be used on any type of ceiling. It is made in four different styles with three sizes in each type.

Collins Kelvinator Company, Los Angeles, and **Leo J. Meyberg,** San Francisco, sales representatives of the Kelvinator Corporation, have fourteen carloads of Kelvinators enroute and on order for immediate delivery.

Guilbert Brothers, 276 W. Santa Clara Street, San Jose, Calif., have been appointed as representatives in that territory for the **Electro-Kold Corporation,** Spokane.

Graybar Electric Company, New York, has issued a 1926 fan catalog for alternating and direct current circuits. The catalog is produced in convenient pocket size, containing 47 pages. Photographs, diagrams and complete price lists as well as detailed descriptions of the various types of fans are given.

Fred W. Carlson, sales engineer of the Crouse-Hinds Company, has opened a permanent sample room at 309 Lowman Building, Seattle, where a complete display of the company's products will be shown.

Pittsburgh Transformer Company, Pittsburgh, Pa., has issued bulletins No. 2052 and 2053 which discuss some advantages of Pittsburgh polyphase distribution transformers and Pittsburgh distribution transformers single-phase and polyphase.

The Brown Instrument Company, Philadelphia, has issued catalog No. 92 on the Brown resistance thermometers for measuring temperatures from —300 deg. to +1,000 deg. F., indicating, recording and controlling. Photographs and drawings illustrating the thermometers as well as complete price lists are included in the catalog.

Paul W. Koch & Company, Chicago, has placed on the market a new combination pipe bender vise, which will bend ½ in. and ¾ in. conduit, making accurate bends, angles, radii, etc.

Detrick-Joslyn Company, Los Angeles, has been organized to succeed the Baker-Joslyn Company. The new organization will be located at 110 North Alameda Street, that city, and will continue under the management of **M. L. Joslyn** as president and **H. S. Detrick,** vice-president and general manager.

The Lindley-Dunning Manufacturing Company, Germantown, Philadelphia, is the new name of a company recently incorporated to manufacture pumps and equipment for electric refrigeration. **Elmer D. Dunning,** formerly vice-president and general manager of the **Dunning Compressor Company** of Homesburg, Philadelphia, has given up all active duties in that company and will devote his entire attention to the new corporation.

The McGill Manufacturing Company, Valparaiso, Ind., has placed on the market the new Levolier "Twi-Lite" switch, a small series multiple switch suitable for installing in shallow canopies, portable bases, chandelier bodies and wherever space is limited. This switch dims the light and when dimmed only one-third of the current is used, it is claimed. The three point switch gives "on," "dim" and "off."

The United Electric Company, Canton, Ohio, has issued a folder describing the advantages and conveniences of The Ohio, "the cleaner with the self-starter." The folder is illustrated with photographs and drawings.

Harold E. Trent, Philadelphia, manufacturer of electrical heating and control appliances, has appointed **John V. Calhoun** sales manager. Mr. Calhoun was formerly engineer of furnace construction with Combustion Engineering Corporation, New York City.

General Electric Company, Schenectady, has designed and now is marketing a new line of synchronous motors for general-purpose application. These motors are recommended to drive any load whose torque requirements have heretofore been met with a standard squirrel-cage induction motor.

Jefferson Electric Manufacturing Company, Chicago, has developed what is known as the Jefferson "Nucode" transformer, which has a 10-volt secondary and a capacity of 25 watts. It is recommended for the average residence or small apartment to operate bells, buzzers, annunciators and door openers.

Trico Fuse Manufacturing Company, Milwaukee, has announced the new Trico "Cleartop" fuse, a non-renewable plug fuse of unique design and construction. Some of the distinctive features claimed for it are: large rugged knurl around top edge, clear India mica window, visible link with amperage stamped thereon, large center contact, and each fuse is guaranteed to show when it blows.

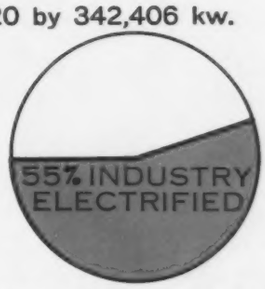
Women of the industry in Spokane are wide awake to the value of practicing resuscitation from electric shock and drowning and are setting the pace in demonstrating the Schaefer method of prone-pressure treatment. A four-girl demonstration team has been organized by the Spokane section of the Women's Committee of the Northwest Electric Light and Power Association. Miss Ruth Wilson is shown applying the Schaefer method to Miss Alfernia Culler, posing as the victim. The demonstration team (inset) consists of the Misses Alfernia Culler, Margaret Hicks, Edna Cottrell and Ruth Wilson, all employees of The Washington Water Power Company. The team was organized under the direction of Miss Mary K. Walsh and J. B. Fisken.

power the Index of Community Growth and Progress

In the territory served by the member companies of the *Northwest Electric Light & Power Association*

Generator rating as of Jan. 1, 1926 exceeded that of Jan. 1, 1920 by 342,406 kw.

Generator rating	Jan. 1, 1920	847,727 kw
Generator rating	Jan. 1, 1926	1,190,133 kw
Hydro	Jan. 1, 1926	955,687 kw
Steam	Jan. 1, 1926	234,446 kw



Industry is 55% electrified

The yearly kilowatt-hour generation in 1925 was 68.5% greater than that in 1921

Kw.-hr. generated	1920	2,911,000,000
Kw.-hr. generated	1926	4,900,000,000

In the six year period connected load increased 763,000 kw.

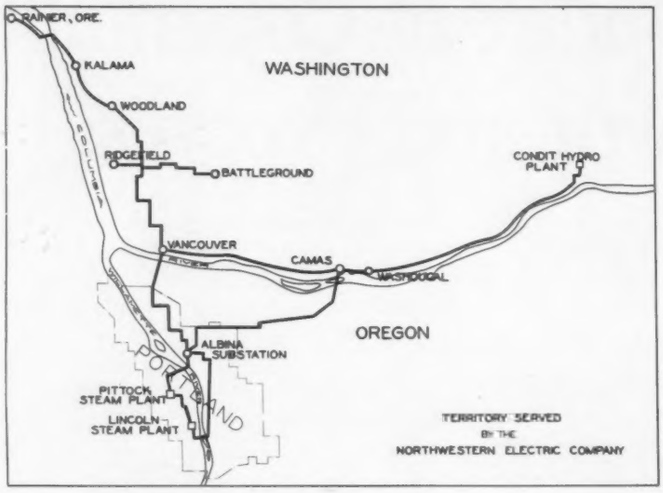
Connected load	Jan. 1, 1920	1,752,800 kw.
Connected load	Jan. 1, 1926	2,515,800 kw.
Domestic and Commercial Lighting	Jan. 1, 1926	938,000 kw.
Industrial	Jan. 1, 1926	577,000 kw.
Mining	Jan. 1, 1926	328,000 kw.
Railroads	Jan. 1, 1926	284,000 kw.
Agricultural	Jan. 1, 1926	86,800 kw.
Miscellaneous	Jan. 1, 1926	302,000 kw

The territory of the Northwest Electric Light & Power Association.

Consumers numbering 264,273 were added by central stations in the Northwest Electric Light & Power Association territory between Jan. 1, 1920 and Jan. 1, 1926.

Total consumers	Jan. 1, 1920	509,944
Total consumers	Jan. 1, 1926	774,217
Domestic	Jan. 1, 1926	633,350
Commercial	Jan 1, 1926	104,490
Industrial	Jan 1, 1926	36,377

63.3% of all homes are wired



THE

Northwestern

Is Growing with the

Northwest

The following figures are indicative of the rapid development of the Pacific Northwest:

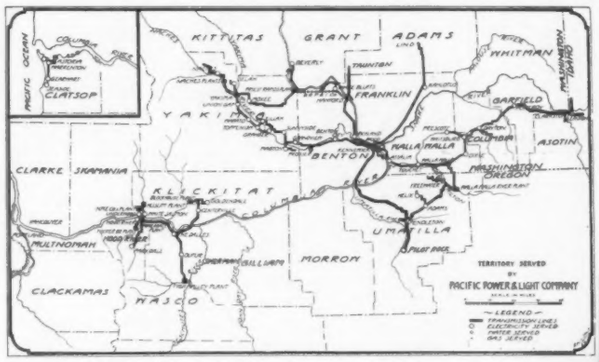
	Jan. 1, 1920	Jan. 1, 1926	Per Cent Increase
Total Electric Consumers	12,973	22,787	75.65
Total kw. Connected Load	40,279	100,663	149.91
Kw-hr. Sold (year ending)	81,813,947	161,016,036	96.81

NORTHWESTERN ELECTRIC COMPANY

Light — Heat — Power

PORTLAND, OREGON

MODERN ELECTRIC SERVICE



Interconnection and Modern Construction

Have Brought Reliable Electric Service to 96 Communities in Oregon, Washington and Idaho

Prior to 1910 the electric service existing in the territory now served by this Company was rendered by small isolated plants.

Pacific Power & Light Company has, in sixteen years of pioneering in the realm of interconnection and rural electrification, contributed materially to the industrial, agricultural and civic development of many important districts of three states.

Today over 700 miles of high-voltage transmission lines connect modern plants and bring reliable electric service to 50,000 customers.

PACIFIC POWER & LIGHT COMPANY